RETURN TO MAIN MENU

Vantage 575

IM744
February, 2003

For use with machines having Code Numbers: **10905**

Safety Depends on You
Lincoln arc welding and cutting equipment is designed and built with safety in mind. However, your overall safety can be increased by proper installation . . . and thoughtful operation on your part. **DO NOT INSTALL, OPERATE OR REPAIR THIS EQUIPMENT WITHOUT READING THIS MANUAL AND THE SAFETY PRECAUTIONS CONTAINED THROUGHOUT.** Most importantly, think before you act and be careful.

Date of Purchase: _____
Serial Number: _____
Code Number: _____
Model: _____
Where Purchased:_____

OPERATOR'S MANUAL

Copyright© 2003 Lincoln Global Inc.

LINCOLN® ELECTRIC

• World's Leader in Welding and Cutting Products •
• Sales and Service through Subsidiaries and Distributors Worldwide •
Sydney, NSW, Australia Tel: 02 9772 7222 Fax: 02 9792 2420
Cleveland, Ohio 44117-1199 USA Tel: 216.481.8100 Fax: 216.486.1751 Web Site: www.lincolnelectric.com

WARNING

CALIFORNIA PROPOSITION 65 WARNINGS

For Diesel Engines: diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

For Petrol Engines: The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

ARC WELDING CAN BE HAZARDOUS. PROTECT YOURSELF AND OTHERS FROM POSSIBLE SERIOUS INJURY OR DEATH. KEEP CHILDREN AWAY. PACEMAKER WEARERS SHOULD CONSULT WITH THEIR DOCTOR BEFORE OPERATING.

Read and understand the following safety highlights. For additional safety information, it is strongly recommended that you purchase a copy of “Safety in Welding & Cutting - ANSI Standard Z49.1” from the American Welding Society, PO Box 351040, Miami, Florida 33135 or CSA Standard W117.2-1974 or WTIA (Welding Technology Institute of Australia), PO Box 6165, Silverwater, NSW, 2128. A free copy of “Arc Welding Safety” booklet E205 is available from the Lincoln Electrical Company, 22801 St Clair Avenue, Cleveland, Ohio 44117-1199.

BE SURE THAT ALL INSTALLATION, OPERATION, MAINTENANCE AND REPAIR PROCEDURES ARE PERFORMED ONLY BY QUALIFIED INDIVIDUALS.

FOR ENGINE powered equipment.

1.a Turn the engine off before troubleshooting and maintenance work unless the maintenance work requires it to be running.

1.b. Operate engines in open, well ventilated areas or vent the engine exhaust fumes outdoors.

1.c. Do not add fuel near an open flame, welding arc or when the engine is running. Stop the engine and allow it to cool before refuelling to prevent spilled fuel from vaporizing on contact with hot engine parts and igniting. Do not spill fuel when filling tank. If fuel is spilled, wipe it up and do not start engine until fumes have been eliminated.

1.d. Keep all equipment, safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing equipment.

1.e. In some cases it may be necessary to remove safety guards to perform required maintenance. Remove guards only when necessary and replace them when the maintenance requiring their removal is complete. Always use the greatest care when working near moving parts.

1.f. Do not put your hands near the engine fan. Do not attempt to override the governor or idler by pushing on the throttle control rods while the engine is running.

1.g. To prevent accidentally starting petrol engines while turning the engine or welding generator during maintenance work, disconnect the spark plug wires, distributor cap or magneto wire as appropriate.

1.h. To avoid scalding, do not remove the radiator pressure cap when the engine is hot.

ELECTRIC AND MAGNETIC FIELDS may be dangerous

2.a. Electric current flowing through any conductor causes localised Electric and Magnetic Fields (EMF). Welding current creates EMF fields around welding cables and welding machines.

2.b. EMF fields may interfere with some pacemakers and welders having a pacemaker should consult their physician before welding.

2.c. Exposure to EMF fields in welding may have other health effects which are now not known.

2.d. All welders should use the following procedures in order to minimise exposure to EMF fields from the welding circuit:

2.d.1. Route the electrode and work cables together. Secure them with tape when possible.

2.d.2. Never coil the electrode lead around your body.

2.d.3. Do not place your body between the electrode and work cables. If the electrode cable is on your right side, the work cable should also be on your right side.

2.d.4. Connect the work cable to the workplace as close as possible to the area being welded.

2.d.5. Do not work next to welding power source.

Mar ‘95

ELECTRIC SHOCK can kill.

3.a. The electrode and work (or ground) circuits are electrically "hot" when the welder is on. Do not touch these "hot" parts with your bare skin or wet clothing. Wear dry, hole-free gloves to insulate hands.

3.b. Insulate yourself from work and ground using dry insulation. Make certain the insulation is large enough to cover your full area of physical contact with work and ground.

In addition to the normal safety precautions, if welding must be performed under electrically hazardous conditions (in damp locations or while wearing wet clothing; on metal structures such as floors, gratings or scaffolds; when in cramped positions such as sitting, kneeling or lying, if there is a high risk of unavoidable or accidental contact with the workpiece or ground) use the following equipment:

- **Semiautomatic DC Constant Voltage (Wire) Welder.**
- **DC Manual (Stick) Welder.**
- **AC Welder with Reduced Voltage Control.**

3.c. In semi-automatic or automatic wire welding, the electrode, electrode reel, welding head, nozzle or semi-automatic welding gun are also electrically "hot".

3.d. Always be sure the work cable makes a good electrical connection with the metal being welded. The connection should be as close as possible to the area being welded.

3.e. Ground the work or metal to be welded to a good electrical (earth) ground.

3.f. Maintain the electrode holder, work clamp, welding cable and welding machine in good, safe operating condition. Replace damaged insulation.

3.g. Never dip the electrode holder in water for cooling.

3.h. Never simultaneously touch electrically "hot" parts of electrode holders connected to two welders because voltage between the two can be the total of the open circuit voltage of both welders.

3.i. When working above floor level, use a safety belt to protect yourself from a fall should you get a shock.

3.j. Also see items 6c and 8.

ARC RAYS can burn.

4 a Use a shield with the proper filter and cover plates to protect your eyes from sparks and the rays of the arc when welding or observing open arc welding. Headshield and filter lens should conform to ANSI Z87.1 standards.

4.b. Use suitable clothing made from durable flame resistant material to protect your skin and that of your helpers from the arc rays.

4.c. Protect other nearby personnel with suitable non flammable screening and/or warn them not to watch the arc or expose themselves to the arc rays or to hot spatter or metal.

FUMES AND GASES can be dangerous

5.a. Welding may produce fumes and gases hazardous to health. Avoid breathing these fumes and gases. When welding, keep your head out of the fume. Use enough ventilation and/or exhaust at the arc to keep fumes and gases away from the breathing zone. **When welding with electrodes which require special ventilation such as stainless or hard facing (see instructions on container or MSDS) or on lead or cadmium plated steel and other metals or coatings which produce highly toxic fumes, keep exposure as low as possible and below Threshold Limit values (TLV) using local exhaust or mechanical ventilation. In confined spaces or in some circumstances, outdoors, a respirator may be required. Additional precautions are also required when welding on galvanized steel.**

5.b. Do not weld in locations near chlorinated hydrocarbon vapours coming from degreasing, cleaning or spraying operations. The heat and rays of the arc can react with solvent vapours to form phosgene, a highly toxic gas, and other irritating products.

5.c. Shielding gases used for arc welding can displace air and cause injury or death. Always use enough ventilation, especially in confined areas, to ensure breathing air is safe.

5.d. Read and understand the manufacturer's instructions for this equipment and the consumables to be used, including the material safety data sheet (MSDS) and follow your employer's safety practices. MSDS forms are available from your welding distributor or from the manufacturer.

5.e. Also see Item 1b.

Mar '95

WELDING SPARKS can cause fire or explosion

6 a Remove fire hazards from the welding area. If this is not possible, cover them to prevent the welding sparks from starting a fire. Remember that welding sparks and hot materials from welding can easily go through small cracks and openings to adjacent areas. Avoid welding near hydraulic lines. Have a fire extinguisher readily available.

6.b. Where compressed gases are to be used at the job site, special precautions should be used to prevent hazardous situations. Refer to AS1674 Parts 1 & 2 “Safety in Welding and Cutting” (ANSI Standard Z49.1) and the operating information for the equipment being used.

6.c. When not welding, make certain no part of the electrode circuit is touching the work or ground. Accidental contact can cause overheating and create a fire hazard.

6.d. Do not heat, cut or weld tanks, drums or containers until the proper steps have been taken to insure that such procedures will not cause flammable or toxic vapours from substances inside. These can cause an explosion even though the vessel has been “cleaned”. For information purchase “Recommended Safe Practices for the Preparation for Welding and Cutting of Containers and Piping that have held Hazardous Substances”, AWS F4.1 from the American Welding Society (see address above).

6.e. Vent hollow castings or containers before heating, cutting or welding. They may explode.

6.f. Sparks and spatter are thrown from the welding arc. Wear oil free protective garments such as leather gloves, heavy shirt, cuffless trousers, high shoes and a cap over your hair. Wear ear plugs when welding out of position or in confined places. Always wear safety glasses with side shields when in a welding area.

6.g. Connect the work cable to the work as close to the welding area as possible. Work cables connected to the building framework or other locations away from the welding area increase the possibility of the welding current passing through lifting chains, crane cables or other alternate circuits. This can create fire hazards or overheat lifting chains or cables until they fail.

6.h. Also see Item 1c.

CYLINDER may explode if damaged

7.a. Use only compressed gas cylinders containing the correct shielding gas for the process used and properly operating regulators, designed for the gas and pressure used. All hoses, fittings, etc. should be suitable for the application and maintained in good condition.

7.b. Always keep cylinders in an upright position and securely chained to an undercarriage or fixed support.

7.c. Cylinders should be located :

- Away from areas where they may be struck or subjected to physical damage.
- A safe distance from arc welding or cutting operations and any other source of heat, sparks or flame.

7.d. Never allow the electrode, electrode holder, or any other electrically “hot” parts to touch a cylinder.

7.e. Keep your head and face away from the cylinder valve outlet when opening the cylinder valve.

7.f. Valve protection caps should always be in place and hand-tight except when the cylinder is in use or connected for use.

7.g. Read and follow the instructions on compressed gas cylinders, associated equipment, and CGA publication P-I, “Precautions for Safe Handling of Compressed Gases in Cylinders”, available from the Compressed Gas Association 1235 Jefferson Davis Highway, Arlington, VA 22202.

FOR ELECTRICALLY powered equipment.

8.a. Turn off input power using the disconnect switch at the fuse box before working on the equipment.

8.b. Install equipment in accordance with the National Electrical Code, all local codes and the manufacturer’s recommendations.

8.c. Ground the equipment in accordance with the National Electrical Code and the manufacturer’s recommendations.

Mar ‘95

PRÉCAUTIONS DE SÛRETÉ

Pour votre propre protection lire et observer toutes les instructions et les précautions de sûreté specifiques qui parraissent dans ce manuel aussi bien que les précautions de sûreté générales suivantes:

Sûreté Pour Soudage A L'Arc

1. Protegez-vous contre la secousse électrique:

   a. Les circuits à l'électrode et à la piéce sont sous tension quand la machine à souder est en marche. Eviter toujours tout contact entre les parties sous tension et la peau nue ou les vétements mouillés. Porter des gants secs et sans trous pour isoler les mains.
   b. Faire trés attention de bien s'isoler de la masse quand on soude dans des endroits humides, ou sur un plancher metallique ou des grilles metalliques, principalement dans les positions assis ou couché pour lesquelles une grande partie du corps peut être en contact avec la masse.
   c. Maintenir le porte-électrode, la pince de masse, le câble de soudage et la machine à souder en bon et sûr état defonctionnement.
   d. Ne jamais plonger le porte-électrode dans l'eau pour le refroidir.
   e. Ne jamais toucher simultanément les parties sous tension des porte-électrodes connectés à deux machines à souder parce que la tension entre les deux pinces peut être le total de la tension à vide des deux machines.
   f. Si on utilise la machine à souder comme une source de courant pour soudage semi-automatique, ces precautions pour le porte-électrode s'applicuent aussi au pistolet de soudage.

2. Dans le cas de travail au dessus du niveau du sol, se protéger contre les chutes dans le cas ou on recoit un choc. Ne jamais enrouler le câble-électrode autour de n'importe quelle partie du corps.

3. Un coup d'arc peut être plus sévère qu'un coup de soliel, donc:

   a. Utiliser un bon masque avec un verre filtrant approprié ainsi qu'un verre blanc afin de se protéger les yeux du rayonnement de l'arc et des projections quand on soude ou quand on regarde l'arc.
   b. Porter des vêtements convenables afin de protéger la peau de soudeur et des aides contre le rayonnement de l'arc.
   c. Protéger l'autre personnel travaillant à proximité au soudage à l'aide d'écrans appropriés et non-inflammables.

4. Des gouttes de laitier en fusion sont émises de l'arc de soudage. Se protéger avec des vêtements de protection libres de l'huile, tels que les gants en cuir, chemise épaisse, pantalons sans revers, et chaussures montantes.

5. Toujours porter des lunettes de sécurité dans la zone de soudage. Utiliser des lunettes avec écrans lateraux dans les zones où l'on pique le laitier.

6. Eloigner les matériaux inflammables ou les recouvrir afin de prévenir tout risque d'incendie dû aux étincelles.

7. Quand on ne soude pas, poser la pince à une endroit isolé de la masse. Un court-circuit accidental peut provoquer un échauffement et un risque d'incendie.

8. S'assurer que la masse est connectée le plus prés possible de la zone de travail qu'il est pratique de le faire. Si on place la masse sur la charpente de la construction ou d'autres endroits éloignés de la zone de travail, on augmente le risque de voir passer le courant de soudage par les chaines de levage, câbles de grue, ou autres circuits. Cela peut provoquer des risques d'incendie ou d'echauffement des chaines et des câbles jusqu'à ce qu'ils se rompent.

9. Assurer une ventilation suffisante dans la zone de soudage. Ceci est particuliérement important pour le soudage de tôles galvanisées plombées, ou cadmiées ou tout autre métal qui produit des fumeés toxiques.

10. Ne pas souder en présence de vapeurs de chlore provenant d'opérations de dégraissage, nettoyage ou pistolage. La chaleur ou les rayons de l'arc peuvent réagir avec les vapeurs du solvant pour produire du phosgéne (gas fortement toxique) ou autres produits irritants.

11. Pour obtenir de plus amples renseignements sur la sûreté, voir le code "Code for safety in welding and cutting" CSA Standard W 117.2-1974.

PRÉCAUTIONS DE SÛRETÉ POUR LES MACHINES À SOUDER À TRANSFORMATEUR ET À REDRESSEUR

1. Relier à la terre le chassis du poste conformement au code de l'électricité et aux recommendations du fabricant. Le dispositif de montage ou la piece à souder doit être branché à une bonne mise à la terre.

2. Autant que possible, l'installation et l'entretien du poste seront effectués par un électricien qualifié.

3. Avant de faires des travaux à l'interieur de poste, la debrancher à l'interrupteur à la boite de fusibles.

4. Garder tous les couvercles et dispositifs de sûreté à leur place.

WELDING, EMF & PACEMAKERS

All welders should follow safe practices that minimise their exposure to electric and magnetic fields (EMF).

For welders wearing implanted pacemakers, safe welding practices are particularly important and additional procedures should be followed by those who have decided to continue to weld. (Hopefully in keeping with a doctor's advice).

The following procedures will not eliminate exposure to EMF or the possibility of arc welding having an effect on a pacemaker, however if followed, they will significantly reduce exposure to electric and magnetic fields. Electric and magnetic fields are created any time electric current flows through a conductor, however it is not clear whether such exposure affects ones health.

Some researchers have reported that exposure to EMF may cause leukemia or other illnesses. These claims originally arose in relation to high voltage electric power lines and are very much in dispute in the medical and scientific arena, however the best advice is to minimise your exposure to EMF to protect your health should doctors eventually decide there is a risk.

There are four fundamental facts about EMF:

- With direct current (DC), the field strength is relatively constant and does not change.
- With alternating current (AC), the field strength constantly changes.
- The greater the current flow, i.e. the higher the amps, the stronger the field created by the current
- The closer the conductor or electrical device is to the body, the greater the exposure to the field.

Minimising exposure

All welders should use the following procedures to minimise EMF exposure.

- Route electrode or gun and work cables together. Secure them with tape if possible.
- Never coil the electrode lead around your body.
- Do not place your body between the electrode and work cables. If your electrode cable is on your right side the work cable should also be on your right side.
- Connect the work cable to the work piece as close as possible to the area being welded. (This is also a good practice to eliminate a common problem on welding - a poor work connection.
- Do not work next to the welding power source.

Welders with pacemakers

There is no question that the fields in arc welding can interfere with a pacemakers function. Generally the interference does not permanently damage the pacemaker. Once the wearer leaves the arc welding environment or stops welding, the pacemaker returns to normal functioning. The welding arc has little or no effect on the operation of some pacemakers, especially designs that are bi-polar or designed to filter out such interference.

For a welder or anyone working around electrical equipment the selection of a pacemaker is very important. Get a doctor's advice about which pacemaker is the least sensitive to interference from welding while still being medically suitable.

In addition to the normal safety precautions, the following additional procedures should be adopted by welders with pacemakers.

- Use gas welding when the application is suitable.
- Use the lowest current setting appropriate for the application. Do not exceed 400 amps. Low current (75-200 amps) direct current (DC) welding should be used if arc welding is necessary. Do not TIG weld with high frequency.
- Do not use repeated, short welds. Wait about ten seconds between stopping one weld and starting the next. When having difficulty starting an electrode, do not re-strike the rod repeatedly.
- If you feel light headed, dizzy or faint, immediately stop welding. Lay the electrode holder down so that it does not contact the work and move away from any welding being performed. Arrange your work in advance so that, if you become dizzy and drop the electrode holder, the electrode holder will not fall on your body or strike the work.
- Do not work on a ladder or other elevated position or in a cramped, confined place.
- Do not work alone. Work only in the presence of an individual who understands these precautions and the possible effect welding may have on your pacemaker.
- Do not work near spot welding equipment.
- If you have a pacemaker and wish to continue arc welding, discuss this and any other questions you may have with your physician and follow his or her advice. The doctor may wish to contact the pacemaker manufacturer for a recommendation. As mentioned before, the design of the pacemaker significantly affects the degree to which it is subject to interference from a welding circuit. Do not rely on the fact that you know another welder with a pacemaker who has welded for years without experiencing a problem. That welder and his or her pacemaker may be quite different from you and your pacemaker.

INSTRUCTIONS FOR ELECTROMAGNETIC COMPATIBILITY

WARNING

This welding machine must be used by trained operators only. Read this manual carefully before attempting to use the welding machine.

Conformance

Products displaying the C-Tick mark are in conformity with Australian/New Zealand requirements for Electromagnetic Compatibility (EMC). They are:

- manufactured in conformity with Australian/New Zealand Standard (Emission):- AS/NZS 3652 'Electromagnetic Compatibility - Arc Welding Equipment' (Identical to and reproduced from British Standard EN 50199)
- for using with other Lincoln Electric/LiquidArc equipment.
- designed for industrial and professional use.

Introduction

All electrical equipment generates small amounts of electromagnetic emission. Electrical emission may be transmitted through power lines or radiated through space, similar to a radio transmitter. When emissions are received by other equipment, electrical interference may result. Electrical emissions may effect many kinds of electrical equipment: other nearby welding equipment, radio and TV transmitters and receivers, numerical controlled machines, telephone systems, computers, etc. Be aware that interference may result and extra precautions may be required when a welding power source is used in a domestic establishment.

Installation and Use

The purchaser/user is responsible for installing and using the welding equipment according to the manufacturer's instructions. If electromagnetic disturbances are detected then it shall be the responsibility of the purchaser/user of the welding equipment to resolve the situation with the technical assistance of the manufacturer. In some cases this remedial action may be as simple as earthing (grounding) the welding circuit (see note below). In other cases it could involve constructing an electromagnetic screen enclosing the power source and the work complete with associated input filters. In all cases electromagnetic disturbances must be reduced to the point where they are no longer troublesome.

Note: The welding circuit may or may not be earthed for safety reasons according to national codes. Changing the earthing arrangements should only be authorised by a person who is competent to assess whether the changes increase the risk of injury, eg. by allowing parallel welding current return paths which may damage the earth circuits of other equipment.

Assessment of Area

Before installing welding equipment the purchaser/user shall make an assessment of potential problems in the surrounding area.

The following shall be taken into account:

a. Other supply cables, control cables, signalling and telephone cables above, below and adjacent to the welding equipment;

b. Radio and television transmitters and receivers;

c. Computer and other control equipment;

d. Safety critical equipment, eg. guarding of industrial equipment;

e. The health of people around, eg. the use of pacemakers and hearing aids;

f. Equipment used for calibration or measurement;

g. The immunity of other equipment in the environment. The purchaser/user shall ensure that other equipment being used in the environment is compatible. This may require additional protection measures;

h. The time of the day that welding or other activities are to be carried out.

The size of the surrounding area to be considered will depend on the structure of the building and other activities that are taking place. The surrounding area may extend beyond the boundaries of the premises.

Methods of Reducing Emissions

Mains Supply

Welding equipment should be connected to the mains supply according to the manufacturer's recommendations. If interference occurs, it may be necessary to take additional precautions such as filtering the mains supply. Consideration should be given to shielding the supply cable of permanently installed welding equipment in metallic conduit or equivalent. Shielding should be electrically continuous throughout its length. The shielding should be connected to the welding power source so that good electrical contact is maintained between the conduit and the welding power source enclosure.

Maintenance of the Welding Equipment

The welding equipment should be routinely maintained according to the manufacturer's recommendations. All access and service doors and covers should be closed and properly fastened when the welding equipment is in operation. The welding equipment should not be modified in any way except for those changes and adjustment covered in the manufacturer's instructions. In particular, the spark gaps of arc initiation and stabilising devices should be adjusted and maintained according to the manufacturer's recommendations.

Welding Cables

The welding cables should be kept as short as possible and should be positioned close together, running at or close to the floor level.

Equipotential Bonding

Bonding of all metallic components in the welding installation and adjacent to it should be considered. However, metallic components bonded to the work piece will increase the risk that the operator could receive a shock by touching these metallic components and the electrode at the same time. The operator should be insulated from all such bonded metallic components.

Earthing of the workpiece

Where the workpiece is not bonded to earth for electrical safety, nor connected to earth because of its size and position, eg. ship's hull or building steelwork, a connection bonding the workpiece to earth may reduce emissions in some, but not all instances. Care should be taken to prevent the earthing of work pieces increasing the risk of injury to users, or damage to other electrical equipment. Where necessary, the connection of the workpiece to earth should be made by direct connection to the workpiece, but in some countries where direct connection is not permitted, the bonding should be achieved by suitable capacitance, selected according to national regulations.

Screening and Shielding

Selective screening and shielding of other cables and equipment in the surrounding area may alleviate problems of interference. Screening of the entire welding installation may be considered for special applications.*

* Portions of the preceding text are contained in AS/NZS3652: 'Electromagnetic Compatibility - Arc Welding Equipment'.

vii

Thank You — for selecting a **QUALITY** product by Lincoln Electric. We want you to take pride in operating this Lincoln Electric Company product - as much pride as we have in bringing this product to you!

Please Examine Carton and Equipment for Damage Immediately

When this equipment is shipped, title passes to the purchaser upon receipt by the carrier. Consequently, claims for material damaged in shipment must be made by the purchaser against the transportation company at the time the shipment is received.

Please record your equipment identification information below for future reference. This information can be found on your machine nameplate.

Model Name & Number _____

Code & Serial Number _____

Date of Purchase _____

Whenever your request replacement parts for or information on this equipment, always supply the information you have recorded above.

Read this Operator's Manual completely before attempting to use this equipment. Save this manual and keep it handy for quick reference. Pay particular attention to the Safety Instructions we have provided for your protection. The level of seriousness to be applied to each is explained below:

⚠ WARNING

This statement appears where the information **must** be followed **exactly** to avoid **serious personal injury or loss of life.**

⚠ CAUTION

This statement appears where the information **must** be followed **exactly** to avoid **minor personal injury or damage to this equipment.**

TABLE OF CONTENTS

	Page
Safety	i-vi
Installation	**Section A**
Technical Specifications	A-1
Safety Precautions	A-2
Location / Ventilation	A-2
Storing	A-2
Stacking	A-2
Angle of Operation	A-2
Lifting	A-3
High Altitude Operation	A-3
High Temperature Operation	A-3
Towing	A-3
Pre-Operation Engine Service	A-4
Oil	A-4
Fuel	A-4
Fuel Cap	A-4
Engine Coolant	A-4
Battery Connection	A-4
Muffler Outlet Pipe	A-5
Spark Arrestor	A-5
Radiator Cap Cover	A-5
Air Cleaner Inlet Hood	A-5
High Frequency Generators for TIG Applications	A-5
Remote Control	A-5
Welding Terminals	A-5
Welding Output Cables	A-6
Machine Earthing	A-6
Auxiliary Power Receptacles	A-6
Standby Power Connections	A-6
Connection of Lincoln Electric Wire Feeders	A-7, A-8
Operation	**Section B**
Safety Instructions	B-1
General Description	B-1
Recommended Applications	B-1
Controls and Settings	B-2
Engine Controls	B-2, B-3
Welding Controls	B-4
Auxiliary Power Controls	B-4
Engine Operation	B-5
Starting The Engine	B-5
Stopping the Engine	B-5
Break-In Period	B-6
Typical Fuel Consumption	B-6
Welding Operation	B-6
Stick Welding Mode	B-6
CC-Stick Mode	B-6
Downhill Pipe Mode	B-6
Touch Start TIG Mode	B-6
Vantage Settings when using K930-2 TIG Module	B-7
Typical Current Ranges for Tungsten Electrodes	B-8
CV-Wire Mode	B-8
Arc Gouging	B-8
Paralleling	B-8
Auxiliary Power Operation	B-8
Simultaneous Welding and Auxiliary Power Loads	B-8
Simultaneous Welding and Power Loads, Extension Cord Length Recommendations	B-9

ix

TABLE OF CONTENTS

Accessories . . . . . **Section C**
Optional Field Installed Accessories C-1

Maintenance . . . . . **Section D**
Safety Precautions D-1
Routine and Periodic Maintenance D-1
Engine Maintenance D-1
Air Filter D-1
Fuel Filters D-2
Cooling System D-2
Battery Handling D-2
Nameplate / Warning Decal Maintenance D-3
Welder / Generator Maintenance D-3
Engine Maintenance Components D-3

Troubleshooting . . . . . **Section E**

Wiring, Connection Diagrams and Dimension Print . . . . . **Section F**

Parts Lists . . . . . **P.466 Series**

TECHNICAL SPECIFICATIONS - Vantage 575 (K2170-1)

INPUT - DIESEL ENGINE					
Make /Model	**Description**	**Speed (RPM)**	**Displacement**	**Starting System**	**Capacities**
Cummins B3.3 Diesel Engine	4 cylinder 36kw (48 HP) @ 1500 RPM	High Idle 1590 Low Idle 1300 Full Load 1500	3.3L (199 cu in) **Bore x Stroke** 95mm x 115mm (3.74” x 4.53”)	12VDC battery & Starter	Fuel 94.6L (25 US gal) Oil: 7.5L (2 US gal) Coolant: 11.8L (2.6 US gal)

RATED OUTPUT @ 40°C(104°F) - WELDER		
Duty Cycle	**Welding Output**	**Volts at Rated Amps**
100%	450 Amps (DC multi-purpose)	38 Volts
60%	500 Amps (DC multi-purpose)	40 volts

OUTPUT @ 40°C(104°F) - WELDER AND GENERATOR

Welding Range

30 - 500 Amps CC/CV
20 - 250 Amps TIG

Open Circuit Voltage

60 Max OCV @ 1590 RPM

Auxiliary Power [1] **(50 Hz)**

Outlets x Phase	Voltage	Power	Amps
1 x 3ph	380 Volt	12kVA	18.5 Amps
3 x 1ph	220 Volt	10kVA	15 Amps

PHYSICAL DIMENSIONS			
Height [2]	**Width**	**Depth**	**Weight**
1067mm (42.0 in)	800mm (31.5in)	1603mm (63.1in)	737kg (1625lbs) (Approx)

(CTE) Centre Tapped Earth
1. Output rating in watts is equivalent to volt-amperes at unity power factor.
Output voltage is within +/- 10% at all loads up to rated capacity. When welding, available auxiliary power will be reduced.
2. Top of Enclosure. Add 223.5mm (8.8”) for exhaust.

Read this entire installation section before you start installation.

SAFETY PRECAUTIONS

WARNING

Do not attempt to use this equipment until you have thoroughly read all operating and maintenance manuals supplied with your machine. They include important safety precautions, detailed engine starting, operating and maintenance instructions and parts lists.

ELECTRIC SHOCK can kill.

- **Do not touch electrically live parts such as output terminals or internal wiring.**
- **Insulate yourself from the work and ground.**
- **Always wear dry insulating gloves.**

ENGINE EXHAUST can kill.

- **Use in open, well ventilated areas or vent exhaust outside**

MOVING PARTS can injure.

- **Do not operate with doors open or guards off.**
- **Stop engine before servicing.**
- **Keep away from moving parts**

Only qualified personnel should install, use or service this equipment.

LOCATION / VENTILATION

The welder should be located to provide an unrestricted flow of clean, cool air to the cooling air inlets and to avoid restricting the cooling air outlets. Also, locate the welder so that the engine exhaust fumes are properly vented to an outside area.

CAUTION

DO NOT MOUNT OVER COMBUSTIBLE SURFACES

Where there is a combustible surface directly under stationary or fixed electrical equipment, that surface should be covered with a steel plate at least 1.6mm thick, which should extend not less than 150mm beyond the equipment on all sides.

STORING

1. Store the machine in a cool, dry place when it is not in use. Protect it from dust and dirt. Keep it where it can't be accidentally damaged from construction activities, moving vehicles, and other hazards.
2. Drain the engine oil and refill with fresh 10W30 oil. Run the engine for about five minutes to circulate oil to all the parts. See the MAINTENANCE section of this manual for details on changing oil.
3. Remove the battery, recharge it, and adjust the electrolyte level. Store the battery in a dry, dark place.

STACKING

Vantage 575 machines cannot be stacked.

ANGLE OF OPERATION

To achieve optimum engine performance the Vantage 575 should be run in a level position. The maximum angle of operation for the Cummins engine is 35 degrees in all directions. If the engine is to be operated at an angle, provisions must be made for checking and maintaining the oil level at the normal (FULL) oil capacity in the crankcase. When operating the welder at an angle, the effective fuel capacity will be slightly less than that specified.

LIFTING

The Vantage lift bale should be used to lift the machine. The Vantage is shipped with the lift bale retracted. Before attempting to lift the Vantage the lift bale must be secured in a raised position. Secure the lift bale as follows:

a. Open the engine compartment door.

b. Locate the 2 access holes on the upper middle region of compartment wall just below the lift bale.

c. Use the lifting strap to raise the lift bale to the full upright position. This will align the mounting holes on the lift bale with the access holes.

d. Secure the lift bale with 2 thread forming screws. The screws are provided in the shipped loose parts bag.

WARNING

FALLING EQUIPMENT can cause injury.

- **Do not lift this machine using lift bale if it is equipped with a heavy accessory such as a trailer or gas cylinder.**
- **Lift only with equipment of adequate lifting capacity.**
- **` Be sure machine is stable when lifting.**

HIGH ALTITUDE OPERATION

At higher altitudes, output derating may be necessary. For maximum rating, derate the welder output 4% for every 300 meters (984 ft.) above 1500 meters (4920 ft.). For output of 500A and below, derate the welder output 4% for every 300 meters (984 ft.) above 2100 meters (6888 ft.).

Contact a Cummins Service Representative for any engine adjustments that may be required.

HIGH TEMPERATURE OPERATION

At temperatures above 40°C (104°F), output voltage derating may be necessary. For maximum output current ratings, derate welder voltage rating 2 volts for every 10°C (21°F) above 40°C (104°F).

TOWING

The recommended trailer for use with this equipment for road, in-plant and yard towing by a vehicle [1] is Lincoln's K953-1. If the user adapts a non-Lincoln trailer, he must assume responsibility that the method of attachment and usage does not result in a safety hazard nor damage the welding equipment. Some of the factors to be considered are as follows:

1. Design capacity of trailer vs. weight of Lincoln equipment and likely additional attachments.
2. Proper support of, and attachment to, the base of the welding equipment so that there will be no undue stress to the trailer's framework.
3. Proper placement of the equipment on the trailer to insure stability side to side and front to back when being moved and when standing by itself.
4. Typical conditions of use, such as travel speed, roughness of surface on which the trailer will be operated, and environmental conditions.
5. Proper preventative maintenance of trailer.
6. Conformance with federal, state and local laws [1] .

[1] Consult applicable federal, state and local laws regarding specific requirements for use on public highways.

PRE-OPERATION ENGINE SERVICE

READ the engine operating and maintenance instructions supplied with this machine.

WARNING

- **Keep hands away from the engine muffler or HOT engine parts.**
- **Stop engine and allow to cool before fuelling.**
- **Do not smoke when fuelling.**
- **Fill fuel tank at a moderate rate and do not over-fill.**
- **Wipe up spilled fuel and allow fumes to clear before starting engine.**
- **Keep sparks and flame away from tank.**

OIL

The Vantage is shipped with the engine crankcase filled with high quality SAE 10W-30 oil (API class CD or better). Check the oil level before starting the engine. If it is not up to the full mark on the dip stick, add oil as required. Check the oil level every four hours of running time during the first 35 running hours. Refer to the engine Operator's Manual for specific oil recommendations and break-in information. The oil change interval is dependent on the quality of the oil and the operating environment. Refer to the engine Operator's Manual for the proper service and maintenance intervals.

FUEL USE DIESEL FUEL ONLY

Fill the fuel tank with clean, fresh diesel fuel. The capacity of the fuel tank is approx 95 litres. See engine Operator's Manual for specific fuel recommendations. **Running out of fuel may require bleeding the fuel injection pump. NOTE:** Before starting the engine, open the fuel shutoff valve (pointer to be in line with hose).

FUEL CAP

Remove the plastic cap covering from the Fuel Tank Filler neck and install the Fuel Cap.

ENGINE COOLANT

WARNING

HOT COOLANT can burn skin.

- **Do not remove cap if radiator is hot.**

The Vantage is shipped with the engine and radiator filled with a 50% mixture of ethylene glycol and water. See the MAINTENANCE section and the engine Operator's Manual for more information on coolant.

BATTERY CONNECTION

WARNING

GASES FROM BATTERY can explode.

- **Keep sparks, flame and cigarettes away from battery.**

To prevent EXPLOSION when:

- **INSTALLING A NEW BATTERY — disconnect negative cable from old battery first and connect to new battery last.**
- **CONNECTING A BATTERY CHARGER — remove battery from welder by disconnecting negative cable first, then positive cable and battery clamp. When reinstalling, connect negative cable last. Keep well ventilated.**
- **USING A BOOSTER — connect positive lead to battery first then connect negative lead to negative battery lead at engine foot.**

BATTERY ACID can burn eyes and skin.

- **Wear gloves and eye protection and be careful when working near battery.**
- **Follow instructions printed on battery.**

IMPORTANT: To prevent ELECTRICAL DAMAGE WHEN:

a) Installing new batteries.

b) Using a booster.

Use correct polarity — **Negative Ground.**

The Vantage is shipped with the negative battery cable disconnected. Before you operate the machine, make sure the Engine Switch is in the OFF position and attach the disconnected cable securely to the negative (-) battery terminal.

Remove the insulating cap from the negative battery terminal. Replace and tighten negative battery cable terminal. NOTE: This machine is furnished with a wet charged battery; if unused for several months, the battery may require a booster charge. Be sure to use the correct polarity when charging the battery.

MUFFLER OUTLET PIPE

Remove the plastic plug covering the muffler outlet tube. Using the clamp provided secure the outlet pipe extension to the outlet tube. Install the rain cap on the end of the outlet pipe extension.

SPARK ARRESTOR

Some federal, state or local laws may require that petrol or diesel engines be equipped with exhaust spark arrestors when they are operated in certain locations where unarrested sparks may present a fire hazard. The standard muffler included with this welder does not qualify as a spark arrestor. When required by local regulations, a suitable spark arrestor, must be installed and properly maintained.

CAUTION

An incorrect arrestor may lead to damage to the engine or adversely affect performance.

RADIATOR CAP COVER

Install the radiator cap cover using the two screws which are taped to the radiator cap cover.

AIR CLEANER INLET HOOD

Remove the plastic plug covering the air cleaner inlet. Install the air cleaner inlet hood to the air cleaner.

WELDING TERMINALS

The Vantage is equipped with a toggle switch for selecting "hot" welding terminals when in the "WELD TERMINALS ON" position or "cold" welding terminals when in the "REMOTELY CONTROLLED" position.

WELDING OUTPUT CABLES

With the engine off, route the electrode and work cables thru the strain relief bracket provided on the front of the base and connect to the terminals provided. These connections should be checked periodically and tightened if necessary.

Listed in Table A.1 are copper cable sizes recommended for the rated current and duty cycle. Lengths stipulated are the distance from the welder to work and back to the welder again. Cable sizes are increased for greater lengths primarily for the purpose of minimizing cable voltage drop.

Table A.1 Combined Length of Electrode and Work Cables.

	TOTAL COMBINED LENGTH OF ELECTRODE AND WORK CABLES		
AMPS @100% Duty Cycle	Up to 46 L	46-61 L	61-76 L
500	70^2mm	95^2mm	2 x 50^2mm

MACHINE EARTHING

Because this portable engine driven welder creates its own power, it is not necessary to connect its frame to an earth ground, unless the machine is connected to premises wiring (home, shop, etc.).

To prevent dangerous electric shock, other equipment powered by this engine driven welder must:

a) be grounded to the frame of the welder using an earthed type plug,

<u>or</u>

b) be double insulated.

When this welder is mounted on a truck or trailer, its frame must be securely connected to the metal frame of the vehicle. When this engine driven welder is connected to premises wiring such as that in a home or shop, its frame must be connected to the system earth ground. See further connection instructions in the section entitled “Standby Power Connections” as well as Australian Standard AS/NZS 3000 Wiring Rules and the local codes.

In general, if the machine is to be earthed, it should be connected with a 10^2mm or larger copper wire to a solid earth ground such as a metal earth stake going into the ground for at least 1.2m or to the metal framework of a building which has been effectively earthed. The Australian Standard AS/NZS 3000 lists a number of alternate means of grounding electrical equipment. A machine grounding stud marked with the symbol ⏚ is provided on the front of the welder.

REMOTE CONTROL

OUTPUT

The Vantage is equipped with a 6-pin and a 14-pin connector. The 6-pin connector is for connecting the K857 or K857-1 Remote Control or for TIG welding, the K870 foot Amptrol or the K936-2 hand Amptrol. When in the CC-STICK, DOWNHILL PIPE, or CV-WIRE modes and when a remote control is connected to the 6-pin Connector, the auto-sensing circuit automatically switches the OUTPUT control from control at the welder to remote control.

When in TOUCH START TIG mode and when a Amptrol is connected to the 6-Pin Connector, the OUTPUT dial is used to set the maximum current range of the CURRENT CONTROL of the Amptrol.

The 14-pin connector is used to directly connect a wire feeder control cable. In the CV-WIRE mode, when the control cable is connected to the 14-pin connector, the auto-sensing circuit automatically makes the Output Control inactive and the wire feeder voltage control active

WARNING

NOTE: When a wire feeder with a built in welding voltage control is connected to the 14-pin connector, do not connect anything to the 6-pin connector.

AUXILIARY POWER RECEPTACLES

The auxiliary power capacity of the Vantage is 12kVA of 50Hz three phase power. All models are protected by an RCD (Residual Current Device) and a 3 phase 20 amp circuit breaker. The auxiliary power capacity in watts equivalent to volt-amperes at unity power factor.

This model has:

1 x 3 phase and neutral Residual Current Device (RCD) protection (30mA)

1 x 3 phase 20 amp Circuit Breaker

1 x 3 phase 380 volt 18.5 amp

3 x 1 phase 15 amp Circuit Breakers

3 x 1 phase 220 volt 15 amp per outlet

Note: The single-phase outlets are from different phases and cannot be paralleled.

The auxiliary power receptacles should only be used with three or four wire earthed type plugs or approved double insulated tools. The current rating of any plug used with the system must be at least equal to the current capacity of the associated receptacle.

STANDBY POWER CONNECTIONS

The Vantage is suitable for temporary, standby or emergency power using the engine manufacturer's recommended maintenance schedule.

The Vantage can be permanently installed as a standby power unit for 380/220 volt (50Hz). Connections must be made by a licensed electrician who can determine how the 380/220 VAC power can be adapted to the particular installation and comply with all applicable electrical codes. The following information can be used as a guide by the electrician for most applications.

1. Install an isolation switch between the power company meter and the premises disconnect. (the Vantage and the power company supplies must not be connected together).

Switch rating must be the same or greater than the customer's premises disconnect and service over current protection.

2. Take necessary steps to assure load is limited to the capacity of the Vantage by installing a 20 amp, 380 VAC three pole circuit breaker. Loading above the rated output will reduce output voltage below the allowable -10% of rated voltage which may damage appliances or other motor-driven equipment and may result in overheating of the Vantage engine.
3. Install a 20 amp 3 phase plug to the triple-pole circuit breaker using 2.5² mm (minimum) x 4 conductor cable of the desired length. (The 20 amp, plug is available in the optional KA1373 plug kit).
4. Plug this cable into the 3 phase receptacle on the Vantage case front.

CONNECTION OF LINCOLN ELECTRIC WIRE FEEDERS

CAUTION

Shut off welder before making any electrical connections.

CONNECTION OF LN-7, LN-8 OR LN-742 TO THE VANTAGE

- Shut the welder off.
- Connect the LN-7, LN-8 OR LN-742 per instructions on the appropriate connection diagram in the DIAGRAMS section.
- Set the “WIRE FEEDER VOLTAGE” switch to 115V.
- Set the “WIRE FEEDER VOLTMETER” switch to either “+” or “-” as required by the electrode being used.
- Set the “SELECTOR” switch to the “CV-WIRE” position.
- Adjust the “ARC CONTROL” knob to desired Crispness. SOFT for MIG and CRISP for INNERSHIELD.
- Set the “WELDING TERMINALS” switch to the “REMOTELY CONTROLLED” position.
- Set the “IDLE” switch to the “HIGH” position.

CONNECTION OF LN-15 TO THE VANTAGE

These connections instructions apply to both the LN-15 Across-The-Arc and Control Cable models. The LN-15 has an internal contactor and the electrode is not energized until the gun trigger is closed. When the gun trigger is closed the wire will begin to feed and the welding process is started.

- Shut the welder off.
- For electrode Positive, connect the electrode cable to the "+" terminal of the welder and work cable to the "-" terminal of the welder. For electrode Negative, connect the electrode cable "-" terminal of the welder and work cable to the "+" terminal of the welder.
- **Across-The-Arc Model:**
  Attach the single lead from the front of the LN-15 to work using the spring clip at the end of the lead. This is a control lead to supply current to the wire feeder motor; it does not carry welding current.
- **Control Cable Model:**
  Connect Control Cable between Engine Welder and Feeder.

  Set the MODE switch to the "CV-WIRE " position.

  Set the WIRE FEEDER VOLTAGE switch to 42 volts.
- **Across-The-Arc Model:**
  Set the "WELD TERMINALS" switch to "WELD TERMINALS ON"
- **Control Cable Model:**
  Set the "WELD TERMINALS" switch to "REMOTELY CONTROLLED".

  Set the "WIRE FEEDER VOLTMETER" switch to either "+" or "-" as required by the electrode polarity being used.

  Set the "ARC CONTROL" knob to "0" initially and adjust to suit.

  Set the "IDLE" switch to the "High" position.

CONNECTION OF AN LN-23P WIRE FEEDER TO THE VANTAGE

- Shut the welder off.
- Connect the LN-23P per instructions on the appropriate connection diagram in the DIAGRAMS section. (NOTE): When connecting an LN-23P to the Vantage 575, a K350-1 adapter kit must be used.
- Set the Wire Feeder Voltage Switch to 115V.
- Set the “WIRE FEEDER VOLTMETER” switch to “-”.
- Set the “MODE” switch to “CV-WIRE” position.
- Set the “WELDING TERMINALS” switch to “REMOTELY CONTROLLED”.
- Set the ARC CONTROL to “0” initially and adjust to suit.
- Set the “IDLE” switch to the “AUTO” position. When not welding, the Vantage 575 engine will be at the low idle speed. If you are using an LN-23P with the K350-1 adapter kit, the electrode is not energized until the gun trigger is closed. When the gun trigger is closed, the current sensing circuit will cause the Vantage 575 engine to go to high idle speed, the wire will begin to feed and the welding process can be started. When welding is stopped, the engine will revert to low idle speed after approximately 12 seconds unless welding is resumed.

CONNECTION OF THE LN-25 TO THE VANTAGE

The LN-25 with or without an internal contactor may be used with the Vantage. See the appropriate connection diagram in the DIAGRAMS section.

NOTE: The LN-25 (K431) Remote Control Module and (K432) Remote Cable are not recommended for use with the Vantage.

- Shut the welder off.
- For electrode Positive, connect the electrode cable from the LN-25 to the “+” terminal of the welder and work cable to the “-” terminal of the welder. For electrode Negative, connect the electrode cable from the LN-25 to the “-” terminal of the welder and work cable to the “+” terminal of the welder.
- Attach the single lead from the front of the LN-25 to work using the spring clip at the end of the lead. This is a sense lead to supply current to the wire feeder motor; it does not carry welding current.
- Set the SELECTOR switch to the “CV-WIRE” position.
- Set the “WELDING TERMINALS” switch to “WELD TERMINALS ON”
- Adjust the “ARC CONTROL” knob to desired crispness. Generally, welding is best if the “ARC CONTROL” is set to SOFT for MIG and CRISP for INNERSHIELD. You may however, want to start in the middle and adjust (as needed) from there.
- Set the “IDLE” switch to the “AUTO” position. When not welding, the Vantage engine will be at the low idle speed. If you are using an LN-25 with an internal contactor, the electrode is not energized until the gun trigger is closed.

WARNING

If you are using an LN-25 without an internal contactor, the electrode will be energized when the Vantage is started.

- When the gun trigger is closed, the current sensing circuit will cause the wire to begin to feed and the welding process is started.

CONNECTION OF AN NA-3 AUTOMATIC WELDING SYSTEM TO THE VANTAGE

For connection diagrams and instructions for connecting an NA-3 Welding System to the Vantage, refer to the NA-3 Welding System instruction manual. The connection diagram for the LN-8 can be used for connecting the NA-3.

- Set the Wire Feeder Voltage Switch to 115V.

CONNECTION OF PRINCE XL SPOOL GUN TO THE VANTAGE

Connection of the Prince XL Spool Gun requires the use of the K1849-1 Adapter Module.

- Shut the Welder off.
- For electrode Positive, connect the electrode cable to the "+" terminal of the welder and work cable to the "-" terminal of the welder. For electrode Negative, connect the electrode cable "-" terminal of the welder and work cable to the "+" terminal of the welder.
- Connect the Control Cable of the Spool Gun to the Adapter Module and connect the Control Cable of the Adapter Module to the Welder.
- Connect the Gas Hose.
- Set the MODE switch to the "CV-WIRE " position.
- Set the WIRE FEEDER VOLTAGE switch to 42 volts.
- Set the "WELD TERMINALS" switch to "WELD TERMINALS ON".
- Set the "ARC CONTROL" knob to "0" initially and adjust to suit.
- Set the "IDLE" switch to the "High" position

SAFETY INSTRUCTIONS

Read and understand this entire section before operating your Vantage.

WARNING

Do not attempt to use this equipment until you have thoroughly read all operating and maintenance manuals supplied with your machine. They include important safety precautions, detailed engine starting, operating and maintenance instructions and parts lists.

ELECTRIC SHOCK can kill.

- **Do not touch electrically live parts such as output terminals or internal wiring.**
- **Insulate yourself from the work and ground.**
- **Always wear dry insulating gloves.**

ENGINE EXHAUST can kill.

- **Use in open, well ventilated areas or vent exhaust outside**
- **Do not stack anything near the engine.**

MOVING PARTS can injure.

- **Do not operate with doors open or guards off.**
- **Stop engine before servicing.**
- **Keep away from moving parts**

Only qualified personnel should operate this equipment.

ADDITIONAL SAFETY PRECAUTIONS

Always operate the welder with the hinged door closed and the side panels in place as these provide maximum protection from moving parts and insure proper cooling air flow.

GENERAL DESCRIPTION

The Vantage is a diesel engine-driven welding power source. The machine uses a brush type alternating current generator for DC multi-purpose welding and for 380/220 VAC auxiliary stand-by power. The welding control system uses state of the art **Chopper Technology™**.

RECOMMENDED APPLICATIONS

WELDER

The Vantage provides excellent constant current DC welding output for stick (SMAW) and TIG welding. The Vantage also provides excellent constant voltage DC welding output for MIG (GMAW), Innershield (FCAW), Outersield (FCAW-G) and Metal Core welding. In addition the Vantage can be used for Arc Gouging with carbons up to 10mm (3/8”) diameter.

The Vantage is **not recommended** for pipe thawing.

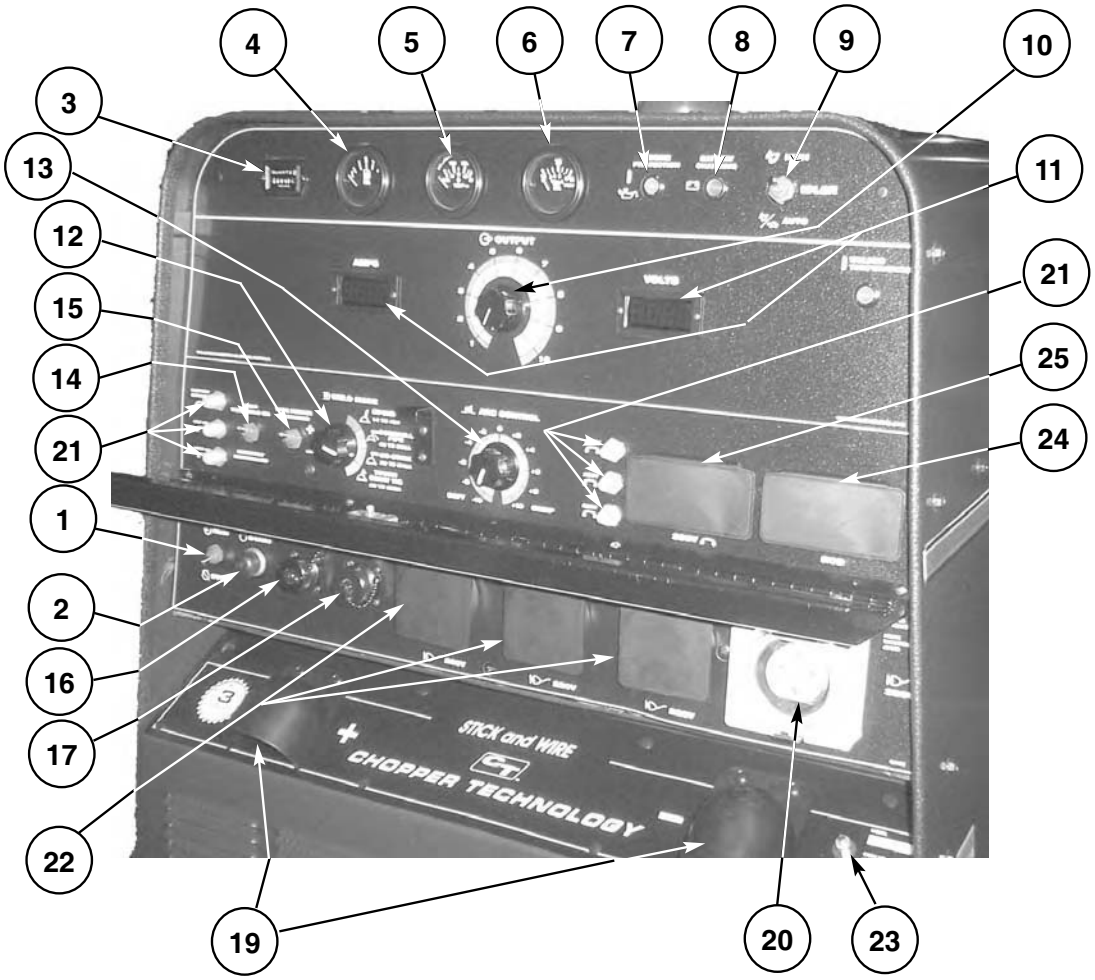
GENERATOR

The Vantage provides smooth output for auxiliary power and emergency standby power.

CONTROLS AND SETTINGS

All welder and engine controls are located on the case front panel. Refer to Figure B.1 and the explanations that follow.

Figure B.1 Case Front Panel Controls



ENGINE CONTROLS (Items 1 through 9)

1. RUN STOP SWITCH

Toggling the switch to the RUN position energizes the fuel solenoid for approximately 30 seconds. The engine must be started within that time or the fuel solenoid will deenergize, and the switch must be toggled to reset the timer.

2. START PUSHBUTTON

Energizes the starter motor to crank the engine. With the engine "Run / Stop" switch in the "Run" position, push and hold the Start button to crank the engine; release as the engine starts. Do not press while engine is running since this can cause damage to the ring gear and/or starter motor.

3. HOUR METER

The hour meter displays the total time that the engine has been running. This meter is a useful indicator for scheduling preventive maintenance.

4. FUEL LEVEL GAUGE

Displays the level of diesel fuel in the fuel tank. The operator must watch the fuel level closely to prevent running out of fuel and possibly having to bleed the system.

5. ENGINE TEMPERATURE GAUGE

The gauge displays the engine coolant temperature.

6. OIL PRESSURE GAUGE

The gauge displays the engine oil pressure when the engine is running.

7. ENGINE PROTECTION

The yellow engine protection light remains off with proper oil pressure and under normal operating temperatures. If the light turns on, the engine protection system will stop the engine. Check for proper oil level and add oil if necessary. Check for loose or disconnected leads at the oil pressure sender located on the engine. The light will remain on when the engine has been shut down due to low oil pressure or over-temperature condition.

8. BATTERY CHARGING LIGHT

The yellow engine alternator light is off when battery charging system is functioning normally. If light turns on the alternator or the voltage regulator may not be operating correctly. The light will remain on when the engine is stopped and the run/stop switch is in the run position.

9. IDLER SWITCH

Has two positions as follows:

A) In the “High” position , the engine runs at the high idle speed controlled by the governor.

B) In the “Auto” / position, the idler operates as follows:

a. When switched from “High” to “Auto” or after starting the engine, the engine will operate at full speed for approximately 12 seconds and then go to low idle speed.

b. When the electrode touches the work or power is drawn for lights or tools (approximately 100 Watts minimum) the engine accelerates and operates at full speed.

c. When welding ceases and the AC power load is turned off, a fixed time delay of approximately 12 seconds starts.

d. If the welding or AC power load is not restarted before the end of the time delay, the idler reduces the engine speed to low idle speed.

e. The engine will automatically return to high idle speed when the welding load or A.C. power load is reapplied.

Idler Operational exceptions

When the WELDING TERMINALS switch is in the “Remotely Controlled” position the idler will operate as follows:

a. When the triggering device (Amptrol, Arc Start Switch, etc.) is pressed the engine will accelerate and operate at full speed provided a welding load is applied within approximately 12 seconds.

- If the triggering device remains pressed but no welding load is applied within approximately 12 seconds the engine will return to low idle speed.
- If the triggering device is released or welding ceases the engine will return to low idle speed after approximately 12 seconds.

WELDING CONTROLS (Items 10 through 19)

10. OUTPUT CONTROL: The OUTPUT dial is used to preset the output voltage or current as displayed on the digital meters for the four welding modes. When in the CC-STICK, DOWNHILL PIPE or CV-WIRE modes and when a remote control is connected to the 6-Pin or 14-Pin Connector, the auto-sensing circuit automatically switches the OUTPUT CONTROL from control at the welder to the remote control. In the CV-WIRE mode, when the wire feeder control cable is connected to the 14-Pin Connector, the auto-sensing circuit automatically makes OUTPUT CONTROL inactive and the wire feeder voltage control active.

When in the TOUCH START TIG mode and when a Amptrol is connected to the 6-Pin Connector, the OUTPUT dial is used to set the maximum current range of the CURRENT CONTROL of the Amptrol.

11. DIGITAL OUTPUT METERS: (Optional Kit)

The digital meters allow the output voltage (CV-WIRE mode) or current (CC-STICK, DOWNHILL PIPE and TIG modes) to be set prior to welding using the OUTPUT control knob. During welding, the meters display the actual output voltage (VOLTS) and current (AMPS). A memory feature holds the display of both meters on the seven seconds after welding is stopped. This allows the operator to read the actual current and voltage just prior to when welding was ceased. While the display is being held the left-most decimal point in each display will be flashing. The accuracy of the meters is ± 3%.

12. WELD MODE SELECTOR SWITCH:

(Provides four selectable welding modes)

CV-WIRE

DOWNHILL PIPE

CC-STICK

TOUCH START TIG

13. ARC CONTROL:

The ARC CONTROL WIRE/STICK knob is active in the WIRE and STICK modes, and has different functions in these modes. This control is not active in the TIG mode.

CC-STICK mode: In this mode, the ARC CONTROL knob sets the short circuit current (arc-force) during stick welding. Increasing the number from -10(Soft) to +10(Crisp) increases the short circuit current and prevents sticking of the electrode to the plate while welding. This can also increase spatter. It is recommended that the ARC CONTROL be set to the minimum number without electrode sticking. Start with a setting at 0.

DOWNHILL PIPE mode: In this mode, the ARC CONTROL knob sets the short circuit current (arc-force) during stick welding to adjust for a soft or a more forceful digging arc (Crisp). Increasing the number from -10(Soft) to +10(Crisp) increases the short circuit current which results in a more forceful digging arc. Typically a forceful digging arc is preferred for root and hot passes. A softer arc is preferred for fill and cap passes where weld puddle control and deposition ("stacking" of iron) are key to fast travel speeds. It is recommended that the ARC CONTROL be set initially at 0.

CV-WIRE mode: In this mode, turning the ARC CONTROL knob from -10(soft) to +10(crisp) changes the arc from soft and washed-in to crisp and narrow. It acts as an inductance/pinch control. The proper setting depends on the procedure and operator preference. Start with a setting of 0.

14. WELDING TERMINALS SWITCH

In the WELD TERMINALS ON position, the output is electrically hot all the time. In the REMOTELY CONTROLLED position, the output is controlled by a wire feeder or amptrol device, and is electrically off until a remote switch is depressed.

15. WIRE FEEDER VOLTMETER SWITCH:

Matches the polarity of the wire feeder voltmeter to the polarity of the electrode.

16. 6 - PIN CONNECTOR

For attaching optional remote control equipment. When in the CC-STICK, DOWNHILL PIPE, and CV-WIRE modes and when a remote control is connected to the Connector, the auto-sensing circuit automatically switches the OUTPUT control from control at the welder to remote control .

When using the TOUCH START TIG mode with a TIG Module connected, the OUTPUT control is used to set the maximum current range of the CURRENT CONTROL on the TIG Module.

17. 14 - PIN CONNECTOR

For attaching wire feeder control cable. Includes contactor closure circuit, auto-sensing remote control circuit, and 42VAC or 115VAC power. The remote control circuit operates the same as the 6-Pin Connector.

18. **42V/115V WIRE FEEDER VOLTAGE SWITCH**

Toggles output of 14-pin connector to voltage requirement of Wire Feeder.(Located above 14-pin connector)

19. WELD OUTPUT TERMINALS + AND -

These 1/2 - 13 studs with flange nuts provide welding connection points for the electrode and work cables. For positive polarity welding the electrode cable connects to the "+" terminal and the work cable connects to this "-" terminal. For negative polarity welding the work cable connects to the "+" terminal and the electrode cable connects to this "-" terminal.

AUXILIARY POWER CONTROLS

(Items 20-25)

20. 380 VAC RECEPTACLE

This is a 380 VAC receptacle that provides auxiliary power. This receptacle has a 20 amp rating. Refer to the AUXILIARY POWER RECEPTACLES section in the installation chapter for further information about this receptacle. Also refer to the AUXILIARY POWER OPERATION section later in this chapter.

21. CIRCUIT BREAKERS

These circuit breakers provide separate overload current protection for each 220V receptacle, the 42VAC AND 115VAC in the 14-Pin connector and battery circuit overload protection.

22. 220VAC RECEPTACLES

These three 220VAC receptacles provide up to 15 amp rating each. Refer to the AUXILIARY POWER RECEPTACLES section in the installation chapter for further information about these receptacles. Also refer to the AUXILIARY POWER OPERATION section later in this chapter.

23. EARTH STUD

Provides a connection point for connecting the machine case to earth. Refer to “MACHINE EARTHING” in the Installation chapter for proper machine earthing information.

24. RCD

Residual Current Device provides protection from Active to Earth contact.

It will not protect against electric shock resulting from contact with Active and Neutral Wires.

25. 3 phase Circuit Breaker

Provides over current protection for the Auxiliary Outputs.

ENGINE OPERATION

STARTING THE ENGINE

1. Open the engine compartment door and check that the fuel shutoff valve located to the left of the fuel filter housing is in the open position (lever to be in line with the hose).
2. Check for proper oil level and coolant level. Close engine compartment door.
3. Remove all plugs connected to the AC power receptacles.
4. Set IDLER switch to “AUTO”.
5. Set the RUN/STOP switch to “RUN”. Observe that the engine protection and battery charging lights are on. After 10 seconds, the engine protection light will turn off.
6. Within 30 seconds, press and hold the engine START button until the engine starts.
7. Release the engine START button when the engine starts.
8. Check that the engine protection and battery charging lights are off. The engine protection light is on after starting, the engine will shutdown in a few seconds. Investigate any indicated problem.
9. Allow the engine to warm up at low idle speed for several minutes before applying a load and/or switching to high idle. Allow a longer warm up time in cold weather.

COLD WEATHER STARTING

With a fully charged battery and the proper weight oil, the engine should start satisfactorily even down to about -10°C. If the engine must be frequently started below -40°C, it may be desirable to install the optional ether starter kit (K887-1). Installation and operating instructions are included in the kit.

STOPPING THE ENGINE

1. Switch the RUN/STOP switch to “STOP”. This turns off the voltage supplied to the shutdown solenoid. A backup shutdown can be accomplished by shutting off the fuel valve located on the fuel line.

BREAK-IN PERIOD

The engine used to supply power for your welder is a heavy duty, industrial engine. It is designed and built for rugged use. It is very normal for any engine to use small quantities of oil until the break-in is accomplished. Check the oil level twice a day during the break-in period. In general this takes 50 to 100 hours of operation.

IMPORTANT

IN ORDER TO ACCOMPLISH THIS BREAK-IN, THE UNIT SHOULD BE SUBJECTED TO HEAVY LOADS, WITHIN THE RATING OF THE MACHINE. AVOID LONG IDLE RUNNING PERIODS.

TYPICAL FUEL CONSUMPTION

Refer to Table B.2 for typical fuel consumption of the Vantage Engine for various operating scenarios.

Table B.2
Cummins B3.3 Engine Fuel Consumption

	Cummins B3.3 36 Kw @1500 RPM	Running Time for 94.6 L (Hours)
Low Idle - no load 1300 RPM	1.6 litres/hour	59.5
High Idle - no load 1590 RPM	2.0 litres/hour	47.3
DC CC Weld Output 450 Amps @ 38 Volts	5.3 litres/hour	17.8
Auxiliary Power 12,000 VA	4.2 litres/hour	21.0

WELDER OPERATION

DUTY CYCLE

Duty Cycle is the the ratio of the uninterrupted on-load duration to 10 minutes. The total time period of one complete on-load and no-load cycle is 10 minutes. For example, in the case of a 60% duty cycle, load is applied continuously for 6 minutes followed by a no-load period of 4 minutes.

STICK WELDING MODE

The Vantage can be used with a broad range of DC stick electrodes.

The MODE switch provides two stick welding settings as follows:

CC-STICK MODE

The CC-STICK position of the MODE switch is designed for horizontal, vertical-up and over head welding with all types of electrodes, especially low hydrogen. The OUTPUT CONTROL knob adjusts the full output range for stick welding.

The ARC CONTROL knob sets the short circuit (arc-force) current during stick welding. Increasing the number from -10 (Soft) to +10 (Crisp) increases the short circuit current and prevents sticking of the electrode to the plate while welding. This can also increase spatter. It is recommended that the ARC CONTROL be set to the minimum number without electrode sticking. Start with the knob set at 0.

DOWNHILL PIPE MODE

This slope controlled setting is intended for “out-of-position” and “down hill” pipe welding where the operator would like to control the current level by changing the arc length. The OUTPUT CONTROL knob adjusts the full output range for pipe welding.

The ARC CONTROL knob sets the short circuit current (arc-force) during stick welding to adjust for a soft or a more forceful digging arc (Crisp). Increasing the number from -10 (Soft) to +10 (Crisp) increases the short circuit current which results in a more forceful digging arc. Typically a forceful digging arc is preferred for root and hot passes. A softer arc is preferred for fill and cap passes where weld puddle control and deposition (“stacking” of iron) are key to fast travel speeds. It is recommended that the ARC CONTROL be set initially at 0.

TOUCH START TIG MODE

The Vantage can be used in a wide variety of DC TIG welding applications.

The TOUCH START TIG setting of the MODE switch is for DC TIG (Tungsten Inert Gas) welding. To initiate a weld, the OUTPUT CONTROL knob is first set to the desired current and the tungsten is touched to the work. During the time the tungsten is touching the work there is very little voltage or current and, in general, avoids tungsten contamination. Then, the tungsten is gently lifted off the work in a rocking motion, which establishes the arc.

To stop the arc, simply lift the TIG torch away from the work piece. When the arc voltage reaches approximately 30 volts, the arc will go out and the machine will automatically reset to the touch start current level. The tungsten may then be retouched to the work piece to restrike the arc. The arc may also be started and stopped with an Amptrol or Arc Start Switch.

The ARC CONTROL is not active in the TIG mode.

In general the ‘Touch Start’ feature avoids tungsten contamination without the use of a Hi-frequency unit. If the use of a high frequency generator is desired, the K930-2 TIG Module can be used with the Vantage. The settings are for reference.

The Vantage is equipped with the required R.F. bypass circuitry for the connection of high frequency generating equipment.

The Vantage and any high frequency generating equipment must be properly grounded. See the K930-2 TIG Module operating manuals for complete instructions on installation, operation, and maintenance.

When using the TIG Module, the OUTPUT control on the Vantage is used to set the maximum range of the CURRENT CONTROL on the TIG Module or an Amptrol if connected to the TIG Module.

VANTAGE SETTINGS WHEN USING THE K930-2 TIG MODULE

- Set the WELD MODE switch to the “Touch Start Tig 20-250 Setting”.
- Set the IDLER switch to the “AUTO” position.
- Set the WELDING TERMINALS switch to the “Remotely Controlled” position. This will keep the solid state contactor open and provide a “cold” electrode until the triggering device (Amptrol or Arc Start Switch) is pressed.

When using the TIG Module, the OUTPUT control on the Vantage 575 is used to set the maximum range of the CURRENT CONTROL on the TIG Module or an Amptrol if connected to the TIG Module.

Table B.3 TYPICAL CURRENT RANGES (1) FOR TUNGSTEN ELECTRODES (2)

Tungsten Electrode Diameter mm (in)	DCEN (-)	DCEP (+)	Approximate Argon Gas Flow Rate l/min (c.f.m.)		TIG TORCH Nozzle Size (4), (5)
	1%, 2% Thoriated Tungsten	1%, 2% Thoriated Tungsten	Aluminium	Stainless Steel	
.25 (0.010)	2-15	(3)	2-4 (3-8)	2-4 (3-8)	#4, #5, #6
.50 (0.020)	5-20	(3)	3-5 (5-10)	3-5 (5-10)	
1.0 (0.040)	15-80	(3)	3-5 (5-10)	3-5 (5-10)	
1.6 (1/16)	70-150	10-20	3-5 (5-10)	4-6 (9-13)	#5, #6
2.4 (3/32)	150-250	15-30	6-8 (13-17)	5-7 (11-15)	#6, #7, #8
3.2 (1/8)	250-400	25-40	7-11 (15-23)	5-7 (11-15)	
4.0 (5/32)	400-500	40-55	10-12 (21-25)	6-8 (13-17)	#8, #10
4.8 (3/16)	500-750	55-80	11-13 (23-27)	8-10 (18-22)	
6.4 (1/4)	750-1000	80-125	13-15 (28-32)	11-13 (23-27)	

(1) When used with argon gas. The current ranges shown must be reduced when using argon/helium or pure helium shielding gases.

(2) Tungsten electrodes are classified as follows by the American Welding Society (AWS):

Pure	EWP
1% Thoriated	EWTh-1
2% Thoriated	EWTh-2

Though not yet recognized by the AWS, Ceriated Tungsten is now widely accepted as a substitute for 2% Thoriated Tungsten in AC and DC applications.

(3) DCEP is not commonly used in these sizes.

(4) TIG torch nozzle “sizes” are in multiples of 1/16ths of an inch:

# 4 =	1/4 in.	6 mm
# 5 =	5/16 in.	8 mm
# 6 =	3/8 in.	10 mm
# 7 =	7/16 in.	11 mm
# 8 =	1/2 in.	12.5 mm
#10 =	5/8 in.	16 mm

(5) TIG torch nozzles are typically made from alumina ceramic. Special applications may require lava nozzles, which are less prone to breakage, but cannot withstand high temperatures and high duty cycles.

CV-WIRE MODE

Connect a wire feeder to the Vantage and set welder controls according to the instructions listed earlier in this section.

The Vantage in the "CV-WIRE" position, permits it to be used with a broad range of flux cored wire (Innershield and Outershield) electrodes and solid wires for MIG welding (gas metal arc welding). Welding can be finely tuned using the "ARC CONTROL". Turning the ARC CONTROL clockwise from -10(soft) to +10(crisp) changes the arc from soft and washed-in to crisp and narrow. It acts as an inductance/pinch control. The proper setting depends on the procedure and operator preference. Start with the knob set at 0.

Note: The 42V/115V Wire Feeder voltage switch position must match voltage requirement of Wire Feeder.

For any electrodes the procedures should be kept within the rating of the machine. For additional electrode information, See www.lincolnelectric.com or the appropriate Lincoln publication.

ARC GOUGING

For optimal performance when arc gouging, set the Vantage "WELD MODE" switch to the "CC - STICK" position, and the "ARC CONTROL" to 10.

Set the "OUTPUT" knob to adjust output current to the desired level for the gouging electrode being used according to the ratings in the following table:

ELECTRODE DIAMETER	CURRENT RANGE (DC, electrode positive)
3.2mm (1/8")	30-60 Amps
4.0mm (5/32")	90-150 Amps
4.8mm (3/16")	200-250 Amps
6.4mm (1/4")	300-400 Amps
8.0mm (5/16")	350-450 Amps
10mm (3/8")	450-575 Amps*

* Maximum current setting is limited to the Vantage maximum of 575 Amps.

PARALLELING

When paralleling machines in order to combine their outputs, all units must be operated in the CC-STICK mode only at the same output settings. To achieve this, turn the WELD MODE switch to the CC-STICK position. Operation in other modes may produce erratic outputs, and large output imbalances between the units.

AUXILIARY POWER OPERATION

Start the engine and set the IDLER control switch to the desired operating mode. Full power is available regardless of the welding control settings, if no welding current is being drawn.

The auxiliary power of the Vantage consists of two 20 Amp-380V receptacle and one 220V receptacles.

The auxiliary power capacity is 10,000 watts of 50 Hz, single phase power or 12,000 watts of 50Hz, three phase power. The auxiliary power capacity rating in watts is equivalent to volt-amperes at unity power factor. The maximum permissible current of the 380 VAC output is 18.8 A. Output voltage is within ± 10% at all loads up to rated capacity.

NOTE: The 220V receptacles are connected to different phases and cannot be paralleled.

The auxiliary power receptacles should only be used with three wire or four wire earth type plugs or approved double insulated tools with two wire plugs.

The current rating of any plug used with the system must be at least equal to the current capacity of the associated receptacle.

SIMULTANEOUS WELDING AND AUXILIARY POWER LOADS

It must be noted that the above auxiliary power ratings are with no welding load. Simultaneous welding and power loads are specified in table B.4. The permissible currents shown assume that current is being drawn from either the 220VAC or 380VAC supply (not both at the same time).

TABLE B.4 Vantage
Simultaneous Welding and Power Loads

Welding Output	Permissible Power - Watts (Unity Power Factor	Permissible Auxiliary Current in Amperes	
		@220 V ±10% *	@ 380 V ±10%
500A-40V	0	0	0
350A/34V	8100	40*	14 amp/phase
200A/30V	12000	50*	18.5 amp/phase
150A/26V	12000	50*	18.5 amp/phase
90A/24V	12000	50*	18.5 amp/phase

* Each receptacle is limited to 15 amps.

TABLE B.5 Vantage
Extension Cord Length Recommendations

Current (Amps)	Voltage Volts)	Load (Watts)	Maximum Allowable Cord Length in m (ft) for Conductor Size											
			2.5²mm	(14AWG)	4.0²mm	(12AWG)	6.0²mm	(10AWG)	10.0²mm	(8AWG)	16.0²mm	(6AWG)	25.0²mm	(4AWG)
15	230	3600	18	(60)	23	(75)	46	(150)	69	(225)	107	(350)	183	(600)
20	230	4800			18	(60)	30	(100)	53	(175)	84	(275)	1373	(450)
Conductor size is based on maximum 2.0% voltage drop														

OPTIONAL FIELD INSTALLED ACCESSORIES

KA1373 POWER PLUG KIT - Provides a plug for each receptacle.

K857 8.5m or K857-20 20m (100ft.) REMOTE CONTROL - Portable control provides same dial range as the output control on the welder from a location up to the specified length from the welder. Has convenient plug for easy connection to the welder. The Vantage 575 is equipped with a 6-pin connector for connecting the remote control.

KIT 1700 - Includes 10m (35ft) of electrode cable and 9m (30ft) of work cable.

KIT 400 - Includes Flip front helmet, cooltong electrode holder, work clamp, wire brush and chipping hammer.

K953-1 TRAILER - Two-wheeled trailer. There is a choice of 2 hitches.

Order: K953-1 Trailer
K958-1 Ball Hitch
K958-2 Lunette Eye Hitch
K965-1 Cable Rack

K887-1 ETHER START KIT - Provides maximum cold weather starting assistance for frequent starting below -4°C (25°F).

Required Ether tank is not provided with kit. (Cannot be used with K1858-1 Service Indicator Kit at the same time.)

K1847-1 SPARK ARRESTOR KIT - Easily mounts to standard muffler.

K949-2 OIL DRAIN KIT - Includes ball valve, hose and clamp.

K1768-2 Dual Output Meters - Dual output meters provide preset ability of voltage for wire welding and current for stick welding. Measures both current and voltage when welding.

K1858-1 Service Indicator Kit - Provides a GO / NO-GO visual indication of air cleaner element useful service life. Filter service based on restriction readings allows the longest life possible from the filter and best engine protection. (Cannot be used with K887-1 Ether Start Kit at the same time.)

SAFETY PRECAUTIONS

WARNING

- Have a qualified technician do the maintenance and troubleshooting work.
- Turn the engine off before working inside the machine.
- Remove guards only when necessary and replace them when the maintenance requiring their removal is complete.
- Always use the greatest care when working near moving parts.

Read the Safety Precautions in front of this manual and the engine instruction manual before working on this machine.

Keep all equipment safety guards, covers and devices in position and in good repair. Keep hands, hair, clothing and tools away from V-belts, gears, fans and all other moving parts when starting, operating or repairing the equipment.

ROUTINE AND PERIODIC MAINTENANCE

DAILY

a. Check the crankcase oil level .

b. Refill the fuel tank to minimize moisture condensation in the tank.

c. Open the water drain valve located on the bottom of the water separator element 1 or 2 turns and allow to drain into a container suitable for diesel fuel for 2 to 3 seconds. Repeat the above drainage procedure until diesel fuel is detected in the container.

d. Check coolant level.

WEEKLY

Blow out the machine with low pressure air periodically. In particularly dirty locations, this may be required once a week.

ENGINE MAINTENANCE

Refer to the “Periodic Checks” section of the Engine Operator’s Manual for the recommended maintenance schedule of the following:

a) Engine Oil and Filter
b) Air Cleaner
c) Fuel Filter - and Delivery System
d) Alternator Belt
e) Battery
f) Cooling System

Refer to Table D.1 at the end of this section for various engine maintenance components.

AIR FILTER

CAUTION

EXCESSIVE AIR FILTER RESTRICTION WILL RESULT IN REDUCED ENGINE LIFE.

The air filter element is a dry cartridge type. It can be cleaned and reused; however, damaged elements should not be reused. Stop engine after 100 hours of running time and clean filter element , replace the filter if necessary. Service air cleaner regularly according to Engine Operator’s Manual.

1. Locate the air filter canister located behind the engine door on the top of the engine.
2. Remove air filter element.
3. Remove loose dirt from element with compressed air or water hose directed from inside out.

   Compressed Air: 7.03 kg/cm^2 psi maximum with nozzles at least 25mm away from element.

   Water Hose: 2.81 kg/cm^2 maximum without nozzle.

4. Soak element in a mild detergent solution for 15 minutes. Do not soak more than 24 hours. Swish element around in the solution to help remove dirt.
5. Rinse elements from inside out with a gentle stream of water (less than 2.81 kg/cm^2) to remove all suds and dirt.
6. Dry element before reuse with warm air at less than 71°C. Do not use a light bulb to dry the element.

7. Inspect for holes and tears by looking through the element toward a bright light. Check for damaged gaskets or dented metal parts. Do not reuse damaged elements. Protect element from dust and damage during drying and storage.
8. Reinstall air filter element.

After six cleanings replace air filter. A cleaned filter will have approximately 70% of the life of a new filter element. A restricted filter element may not appear excessively dirty.

FUEL FILTERS

WARNING

When working on the fuel system:

- Keep naked lights away !
- Do not spill fuel !
- Do not smoke !

The Vantage 575 is equipped with a **Fuel Filter** located after the lift pump and before fuel injectors.The procedure for changing the filter is as follows.

1. Close the fuel shutoff valve.
2. Clean the area around the fuel filter head. Remove the filter. Clean the gasket surface of the filter head and replace the o-ring.
3. Fill the clean filter with clean fuel, and lubricate the o-ring seal with clean lubricating oil.
4. Install the filter as specified by the filter manufacturer.

WARNING

Mechanical overtightening will distort the threads, filter element seal or filter can.

COOLING SYSTEM

The Vantage 575 is equipped with a pressure radiator. Keep the radiator cap tight to prevent loss of coolant. Clean and flush the coolant system periodically to prevent clogging the passage and over-heating the engine.

BATTERY HANDLING

GASES FROM BATTERY can explode.

- **Keep sparks, flame and cigarettes away from battery.**

To prevent EXPLOSION when:

- **INSTALLING A NEW BATTERY - disconnect negative cable from old battery first and connect to new battery last.**

- **CONNECTING A BATTERY CHARGER - Remove battery from welder by disconnecting negative cable first, then positive cable and battery clamp. When reinstalling, connect negative cable last. Keep well ventilated.**

- **USING A BOOSTER - connect positive lead to battery first then connect negative lead to engine foot.**

BATTERY ACID CAN BURN EYES AND SKIN.

- **Wear gloves and eye protection and be careful when working near battery. Follow instructions printed on battery.**

PREVENTING ELECTRICAL DAMAGE

1. When replacing, jumping, or otherwise connecting the battery to the battery cables, the proper polarity must be observed. Failure to observe the proper polarity could result in damage to the charging circuit. The positive (+) battery cable has a red terminal cover.
2. If the battery requires charging from an external charger, disconnect the negative battery cable first and then the positive battery cable before attaching the charger leads. Failure to do so can result in damage to the internal charger components. When reconnecting the cables, connect the positive cable first and the negative cable last.

PREVENTING BATTERY DISCHARGE

Turn the RUN/STOP switch to stop when engine is not running.

PREVENTING BATTERY BUCKLING

Tighten nuts on battery clamp until snug.

CHARGING THE BATTERY

When you charge, jump, replace, or otherwise connect battery cables to the battery, be sure the polarity is correct. Improper polarity can damage the charging circuit. The Vantage positive (+) battery terminal has a red terminal cover.

If you need to charge the battery with an external charger, disconnect the negative cable first, then the positive cable before you attach the charger leads. after the battery is charged, reconnect the positive battery cable first and the negative cable last. Failure to do so can result in damage to the internal charger components.

Follow the instructions of the battery charger manufacturer for proper charger settings and charging time.

NAMEPLATES / WARNING DECALS MAINTENANCE

Whenever routine maintenance is performed on this machine - or at least yearly - inspect all nameplates and labels for legibility. Replace those which are no longer clear. Refer to the parts list for the replacement item number.

WELDER / GENERATOR MAINTENANCE

STORAGE

Store the Vantage in clean, dry protected areas.

CLEANING

Blow out the generator and controls periodically with low pressure air. do this at least once a week in particularly dirty areas.

BRUSH REMOVAL AND REPLACEMENT

It is normal for the brushes and slip rings to wear and darken slightly. Inspect the brushes when a generator overhaul is necessary.

WARNING

Do not attempt to polish slip rings while the engine is running.

Table D.1 Engine Maintenance Components

ITEM	MAKE	PART NUMBER	SERVICE INTERVAL
Air Cleaner Element	Donaldson AC Fleetguard	P181052 A302C AF437K	Replace every 200 hours. (Replace more often when used in dusty and /o r high ambient temperature conditions)
Oil Filer	Cummins Fleetguard	C6002112110 LF3855	Replace every 750 hours or 12 months, whichever is less.
Fan Belt	Cummins	C0412021748	Inspect every 1000 hours or 12 months, whichever is less.
Fuel Strainer	Cummins Fleetguard	3826094 FF5079	Inspect and replace monthly, as required. Replace annually.
Fuel Filter / Water Separator	Cummins Fleetguard	C6003112130 FS19594	Replace every 500 hours or 6 months, whichever is less.
. Battery	-----	BCI GROUP 34	Inspect every 500 hours
Engine Oil Change	See Manual	-----	Change every 750 hours or 3 months, whichever is less. Check daily.

HOW TO USE TROUBLESHOOTING GUIDE

WARNING

Service and Repair should only be performed by Lincoln Electric Factory Trained Personnel. Unauthorized repairs performed on this equipment may result in danger to the technician and machine operator and will invalidate your factory warranty. For your safety and to avoid Electrical Shock, please observe all safety notes and precautions detailed throughout this manual.

This Troubleshooting Guide is provided to help you locate and repair possible machine malfunctions. Simply follow the three-step procedure listed below.

Step 1. LOCATE PROBLEM (SYMPTOM).

Look under the column labelled “PROBLEM (SYMPTOMS)”. This column describes possible symptoms that the machine may exhibit. Find the listing that best describes the symptom that the machine is exhibiting.

Step 2. POSSIBLE CAUSE.

The second column labelled “POSSIBLE CAUSE” lists the obvious external possibilities that may contribute to the machine symptom.

Step 3. RECOMMENDED COURSE OF ACTION

This column provides a course of action for the Possible Cause, generally it states to contact your local Lincoln Authorized Field Service Facility.

If you do not understand or are unable to perform the Recommended Course of Action safely, contact your local Lincoln Authorized Field Service Facility.

CAUTION

If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your Local **Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

Observe all Safety Guidelines detailed throughout this manual

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
ENGINE PROBLEMS		
Major Physical or Electrical Damage is Evident.	1. Contact your Local Lincoln Authorized Field Service Facility.	If all recommended possible areas of misadjustment have been checked and the problem persists, Contact your local Lincoln Authorized Field Service Facility.
Engine will not crank	1. Battery low. 2. Loose battery cable connections which may need Inspected, cleaned or tighten. 3. Faulty wiring in engine starting circuit. 4. Faulty engine starter. Contact authorized local Engine Service Shop.	
Engine will crank but not start.	1. Out of fuel. 2. Fuel shut off valve is in the off position make sure the valve lever is in a vertical direction. Engine shut down solenoid not pulling in. 3. On/Off switch on for more than 30 sec. before starting, the On/Off switch will need to be switch off and turned back on. 4. Fuel Filters dirty/clogged, main filter element and/or Inline Fuel Filter may need to be replaced. 5. High water temperature or low oil pressure (engine protection light lit).	
Engine shuts down shortly after starting.	1. Low oil pressure (engine protection light lit). Check oil level (Consult engine service dealer). 2. High water temperature. Check engine cooling system (engine protection light lit). 3. Faulty oil pressure switch. 4. Faulty water temperature switch. Contact authorized local Engine Service Shop.	
Engine shuts down while under a load.	1. High water temperature.	
Engine runs rough.	1. Dirty fuel or air filters may need cleaned/replaced. 2. Water in fuel.	
Engine will not shut off.	1. Fuel Shutdown solenoid not functioning properly / linkage binding.	

CAUTION

[9]If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
Battery does not stay charged.	1. Faulty battery . 2. Faulty engine alternator. 3. Loose or broken lead in charging circuit. 4. Loose fan belt may need tightening.	If all recommended possible areas of misadjustment have been checked and the problem persists, Contact your local Lincoln Authorized Field Service Facility.
Engine will not idle down to low speed.	1. Idler switch in HIGH idle position, make sure switch is set to AUTO. 2. External load on welder or auxiliary power. 3. Mechanical problem in idler solenoid linkage. 4. Faulty wiring in solenoid circuit. 5. No or low voltage @ idle solenoid 6. Faulty idler solenoid. 7. Faulty, Weld Control PCB, Pull Coil /Battery PCB	
Engine will not go to high idle when attempting to weld.	1. Poor work lead connection to work. 2. Broken idler solenoid spring. 3. Welding Terminals switch in wrong position. 4. No open circuit voltage at output studs. 5. Faulty, Pull Coil/Battery PCB or Weld Control PCB.	
Engine will not go to high idle when using auxiliary power.	1. Broken wire in auxiliary current sensor wiring. 2. Auxiliary power load is less than 100 watts. 3. Faulty Pull Coil/Battery PCB or Weld Control PCB.	

CAUTION

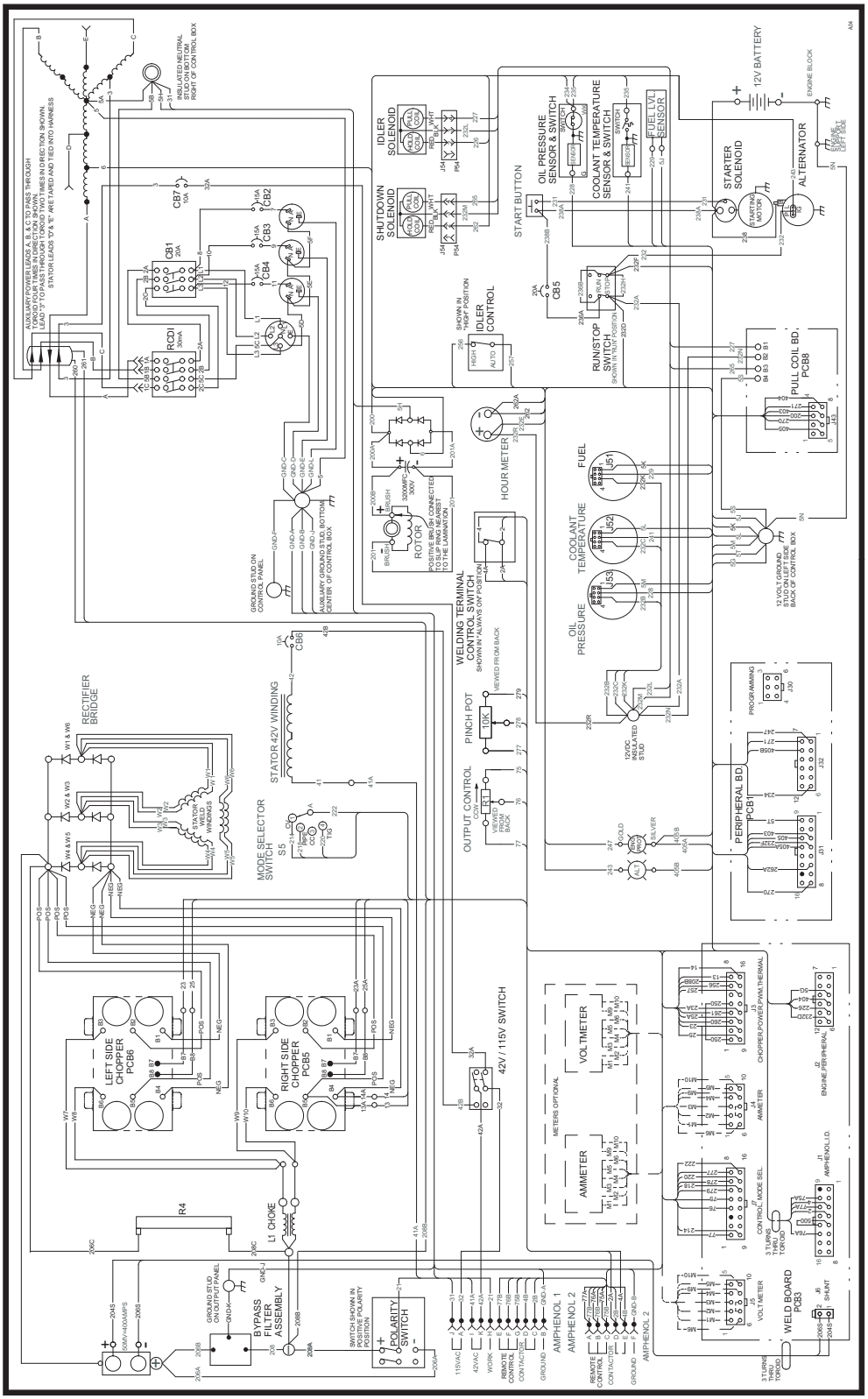
If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

PROBLEMS (SYMPTOMS)	POSSIBLE AREAS OF MISADJUSTMENT(S)	RECOMMENDED COURSE OF ACTION
FUNCTION PROBLEMS		
Engine goes to low idle but does not stay at low idle.	1. Faulty Peripheral PCB, Pull Coil/Battery PCB or Weld Control PCB.	If all recommended possible areas of misadjustment have been checked and the problem persists, Contact your local Lincoln Authorized Field Service Facility.
No welding output or auxiliary output.	1. Broken lead in rotor circuit. 2. Faulty field diode module. 3. Faulty Weld Control P.C. Board. 4. Faulty rotor.	
Welder has some/ no output and no control. Auxiliary output OK	1. Faulty remote kit. 2. Faulty output control potentiometer. 3. Faulty output control wiring. 4. Faulty Weld Control PCB, Pull Coil/Battery PCB or Chopper PCB.	
No welding output. Auxiliary output OK.	1. WELDING TERMINALS switch in wrong position, be sure switch is in WELDING TERMINALS ALWAYS ON position. 2. Faulty Weld Control PCB, Pull Coil/Battery PCB or Chopper PCB.	
No auxiliary power.	1. Open circuit breakers. 2. Faulty connections to auxiliary receptacles. 3. Faulty auxiliary circuit wiring.	

CAUTION

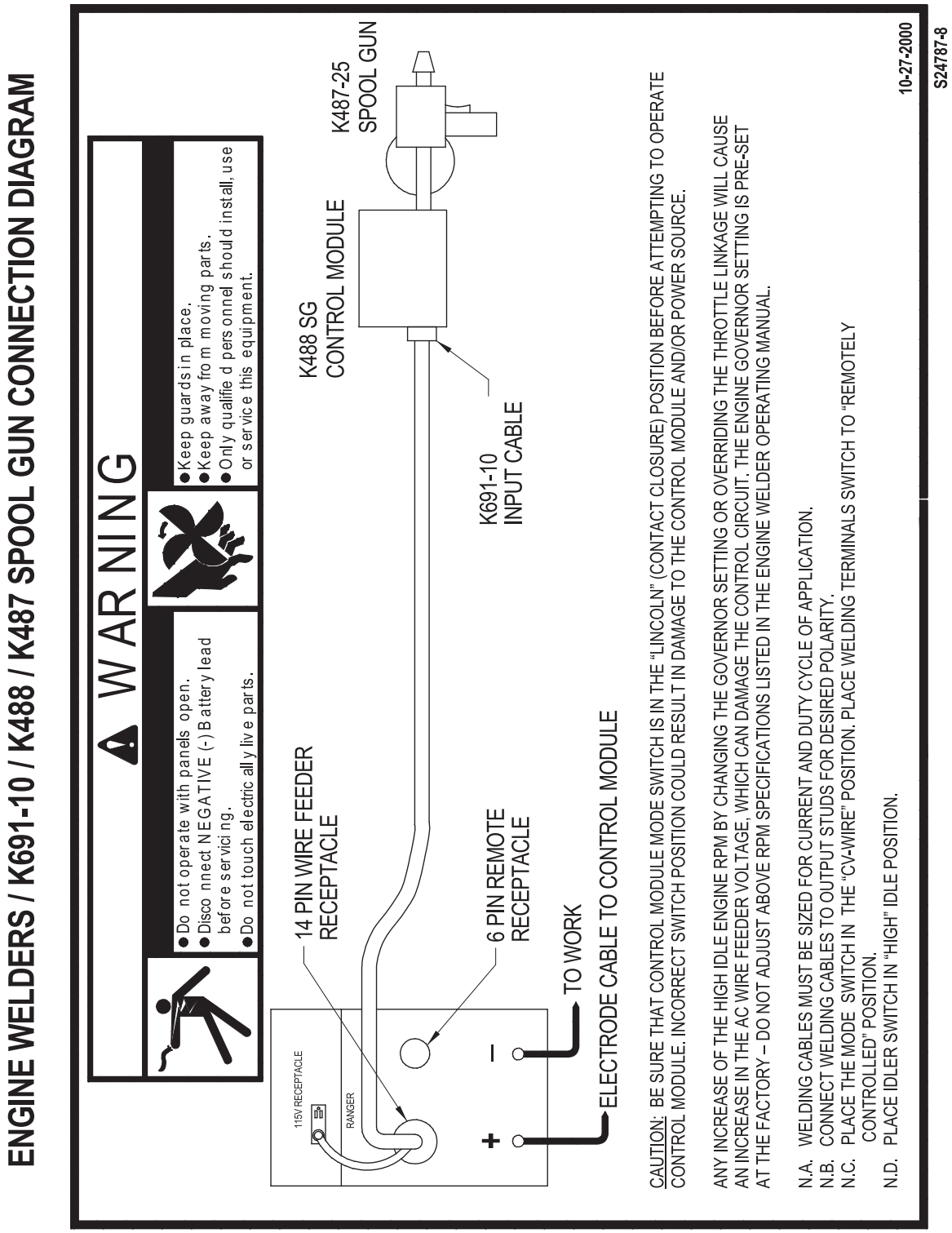
If for any reason you do not understand the test procedures or are unable to perform the tests/repairs safely, contact your **Local Lincoln Authorized Field Service Facility** for technical troubleshooting assistance before you proceed.

VANTAGE 575 WIRING DIAGRAM (K2170-1 50HZ)

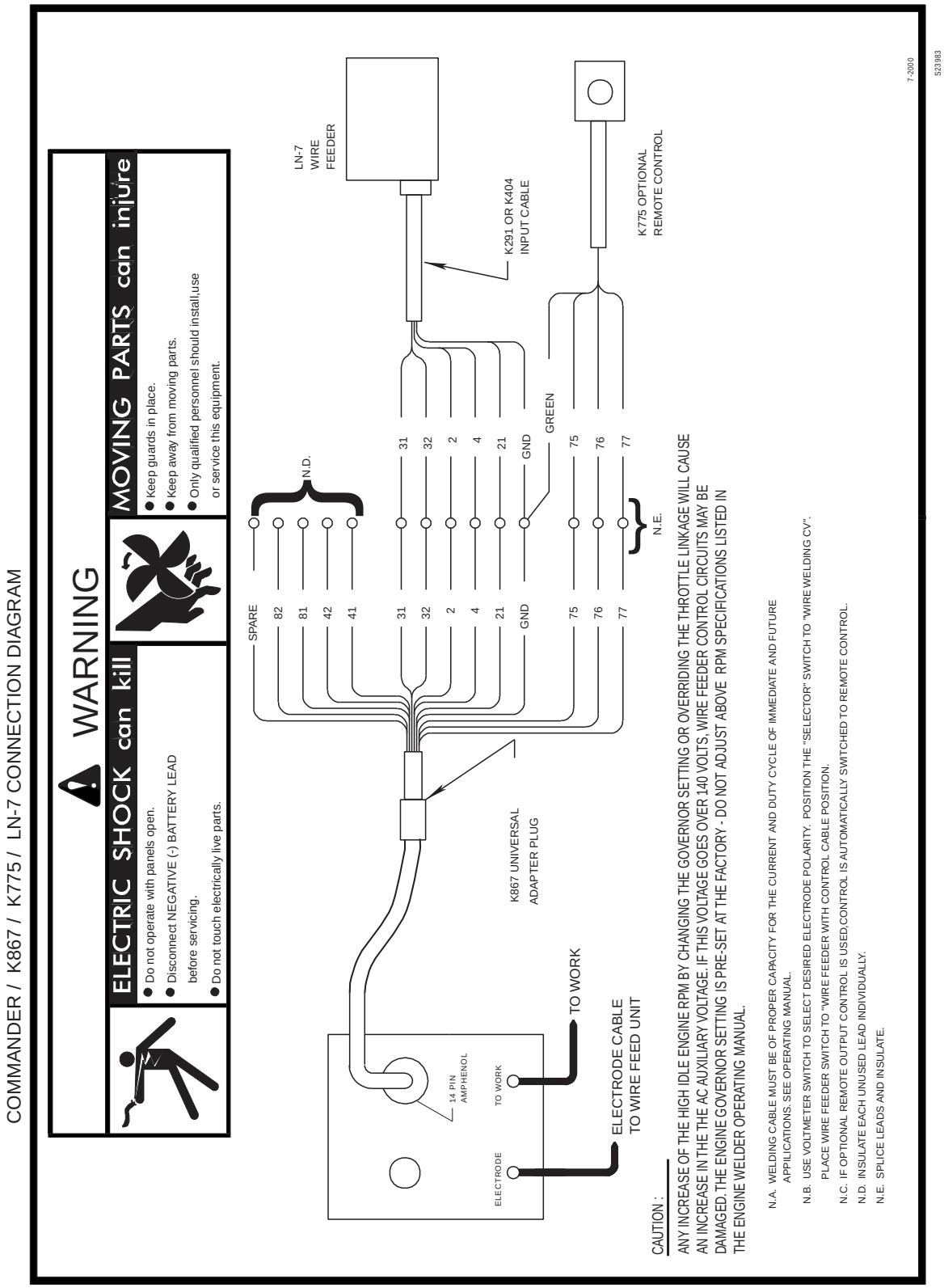


NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific dia- gram for your particular machine is pasted inside the machine on one of the enclosure panels.

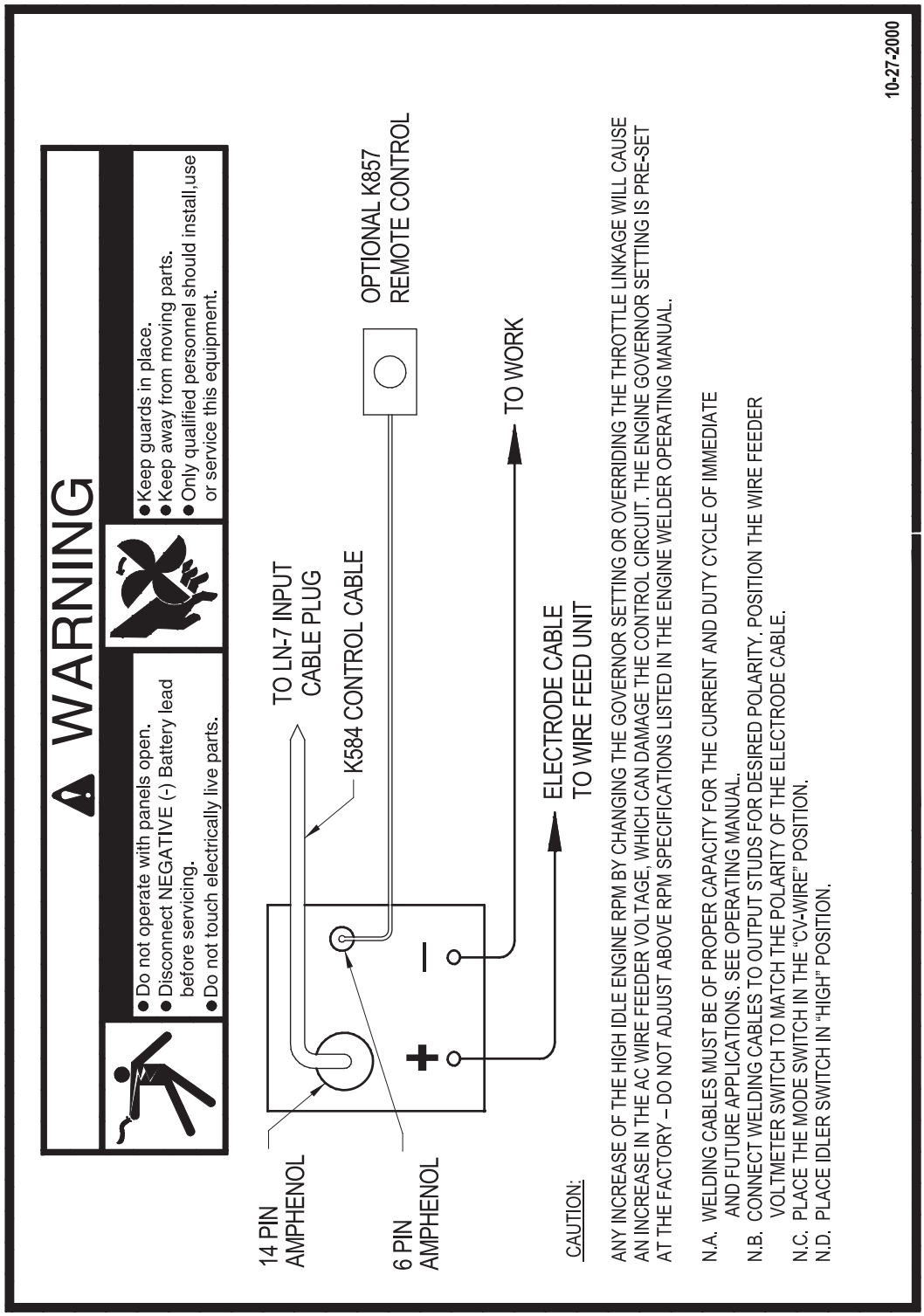
CONNECTION DIAGRAM:



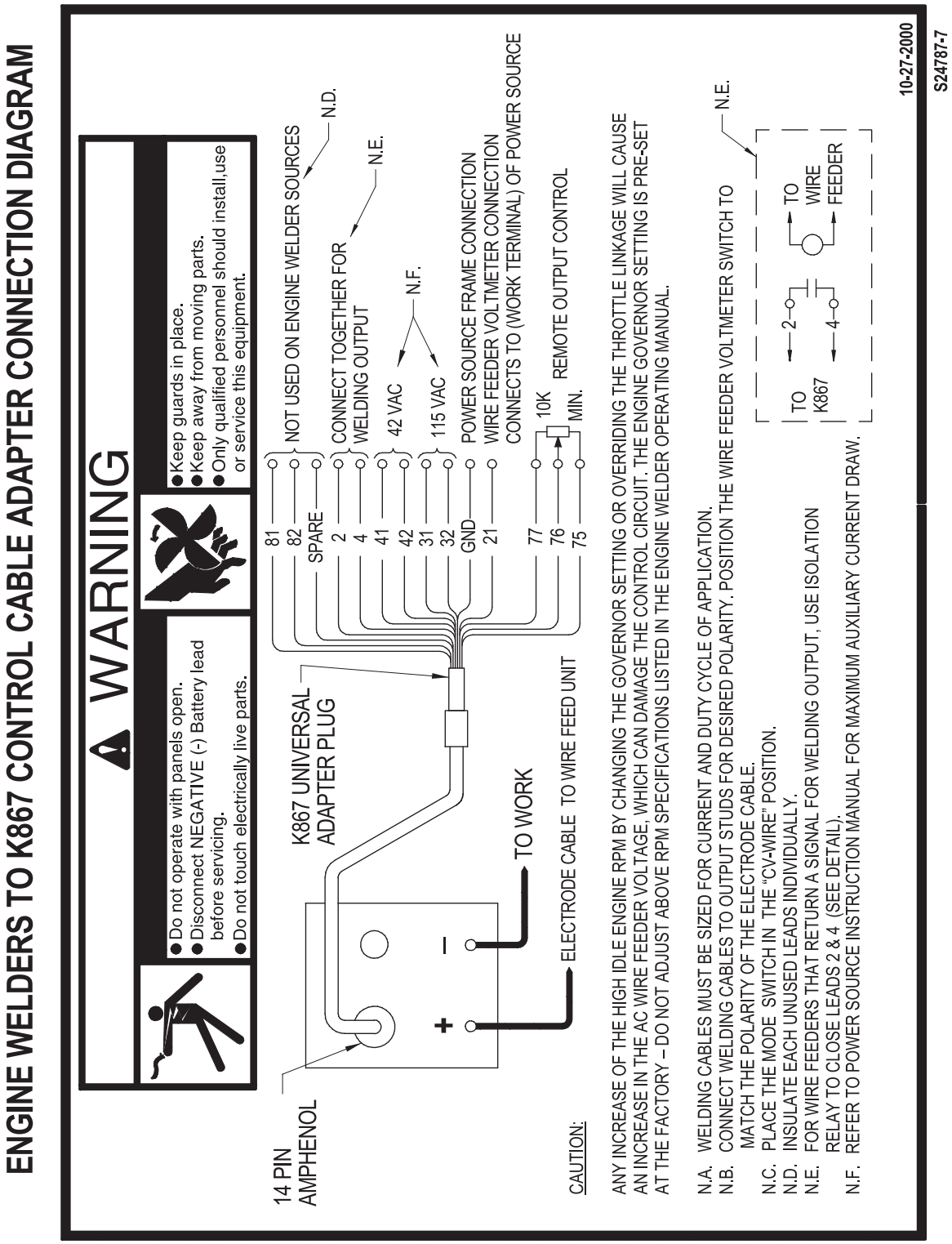
CONNECTION DIAGRAM:



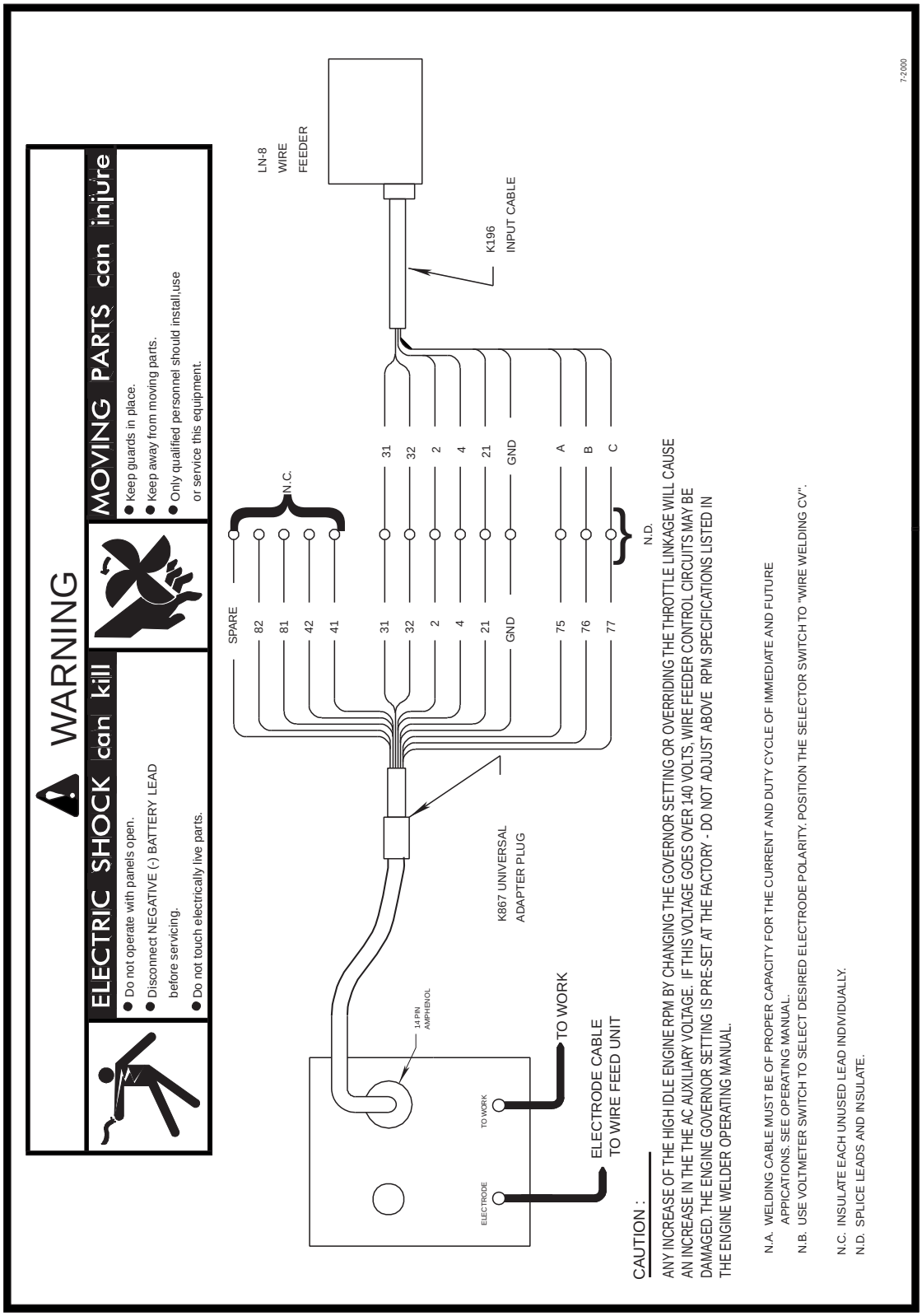
CONNECTION DIAGRAM



CONNECTION DIAGRAM

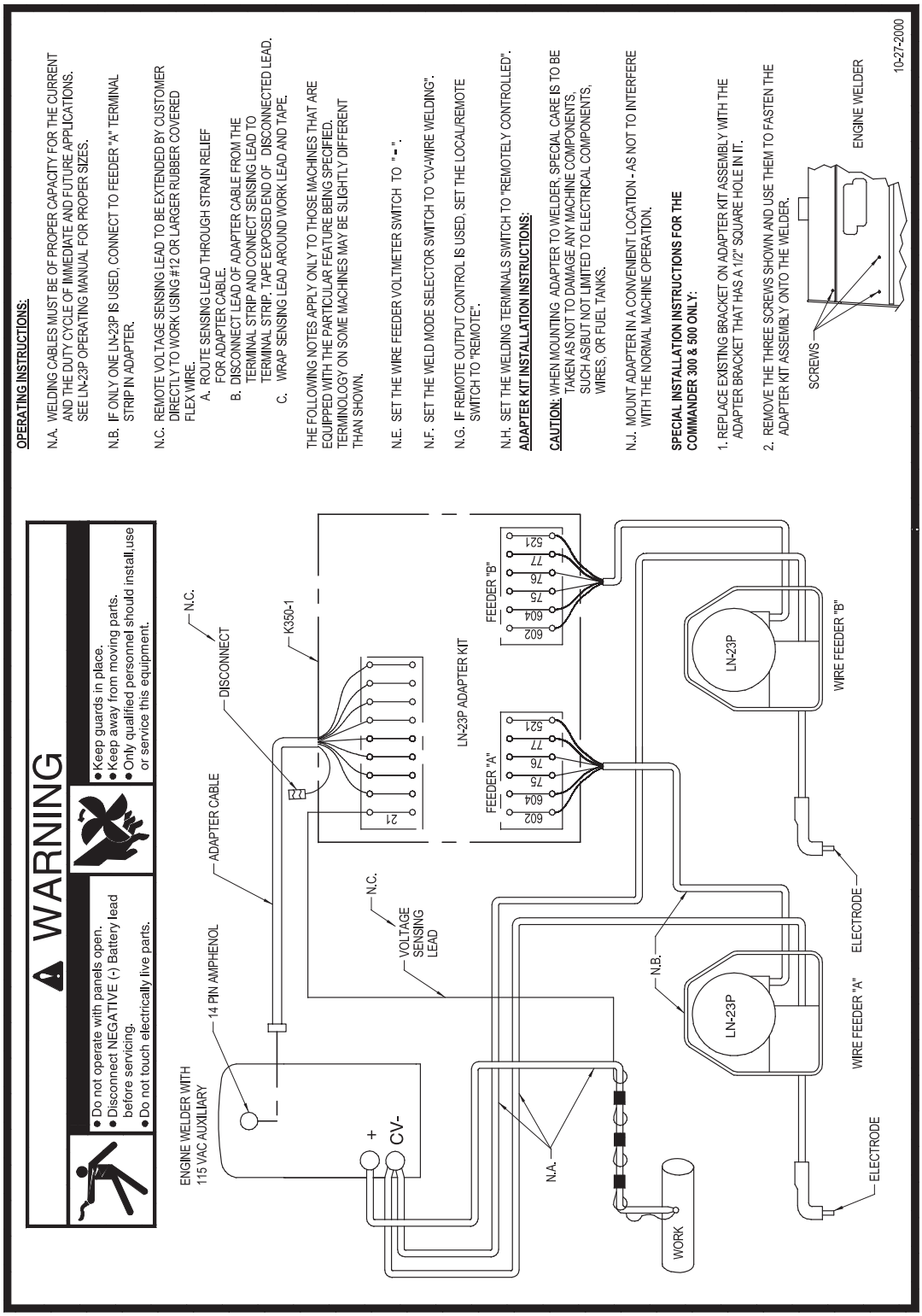


CONNECTION DIAGRAM

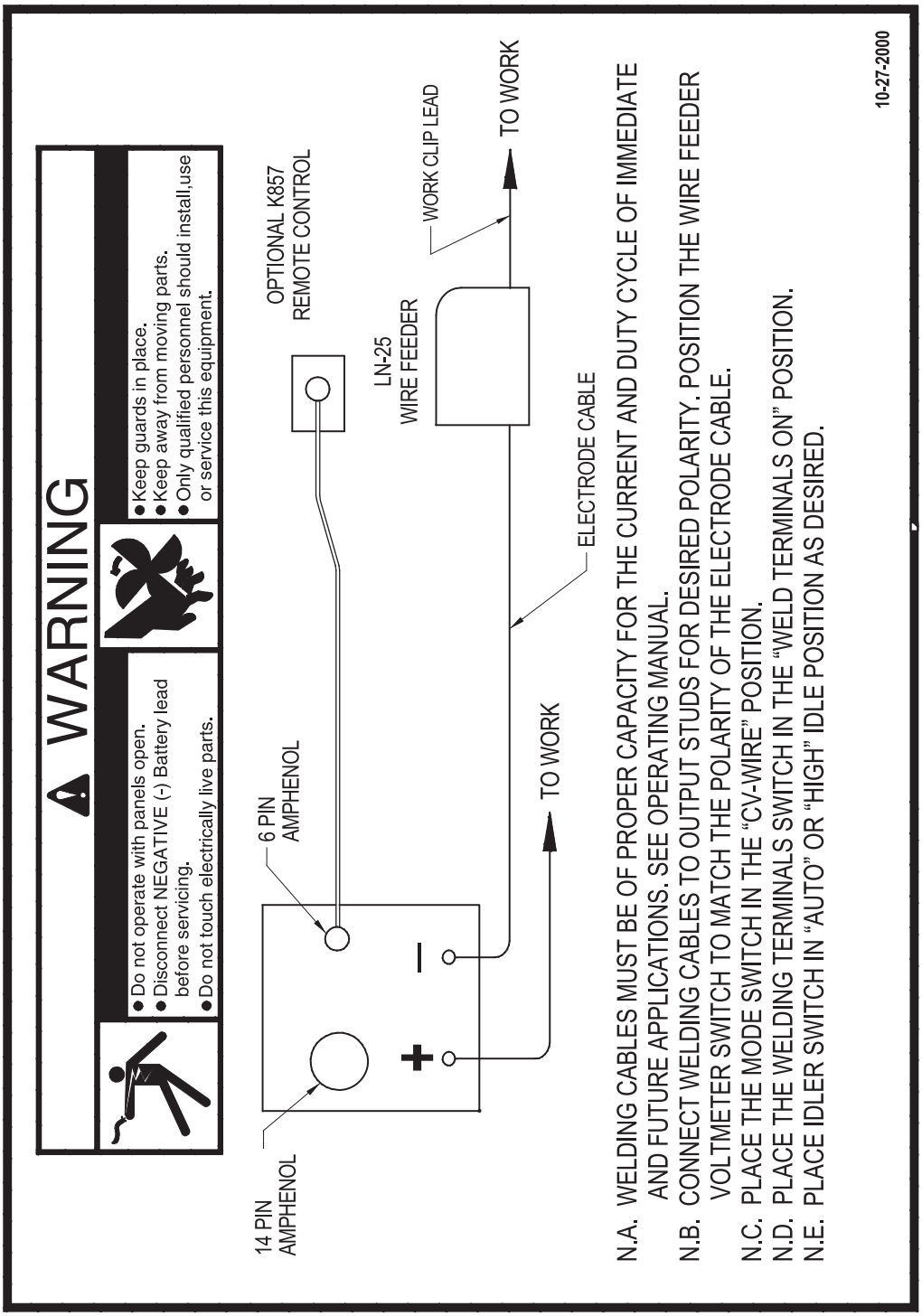


CONNECTION DIAGRAM

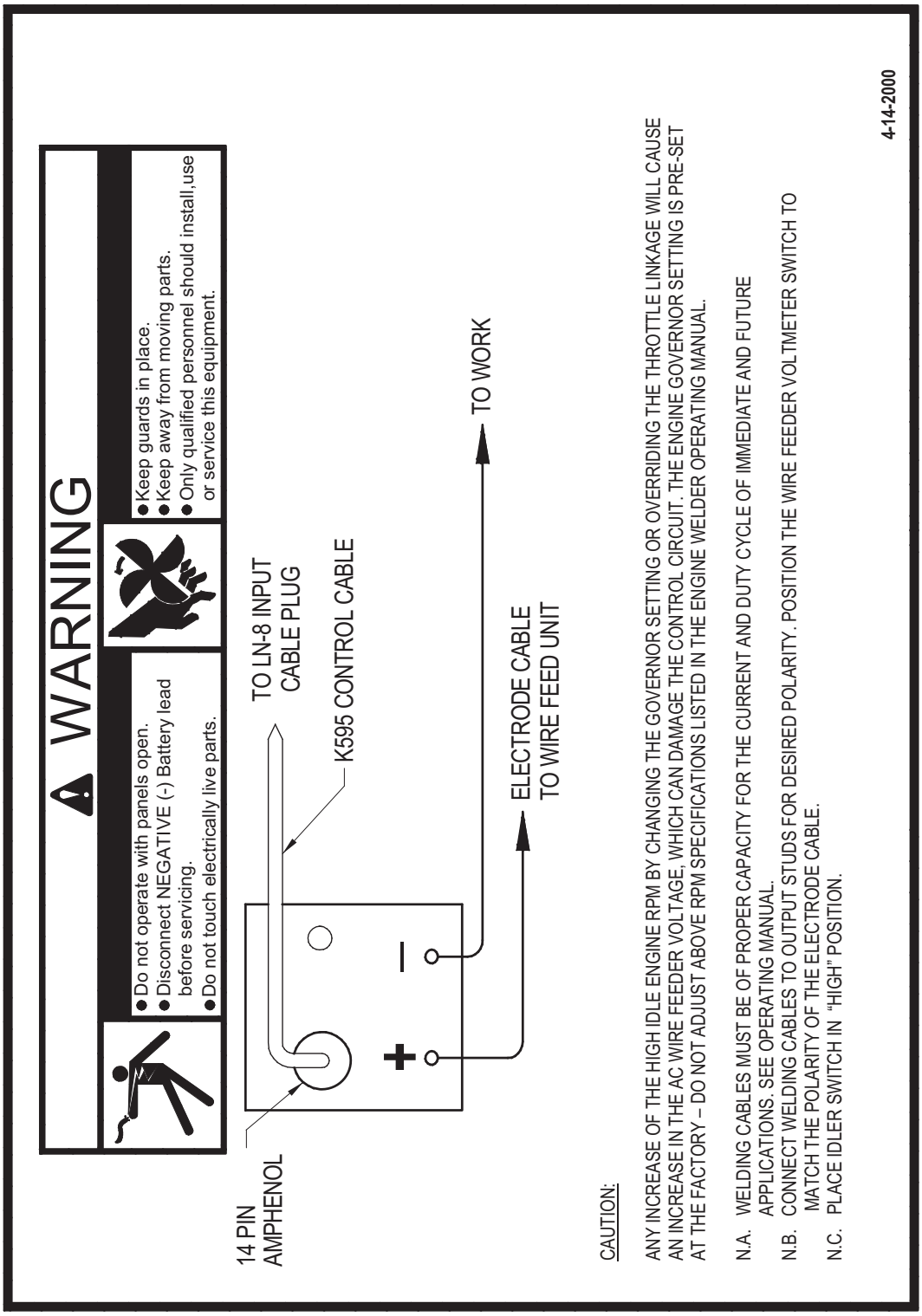
CONNECTION DIAGRAM: ENGINE WELDERS COMPATIBLE WITH LN-23P WITH K350-1 ADAPTER KIT



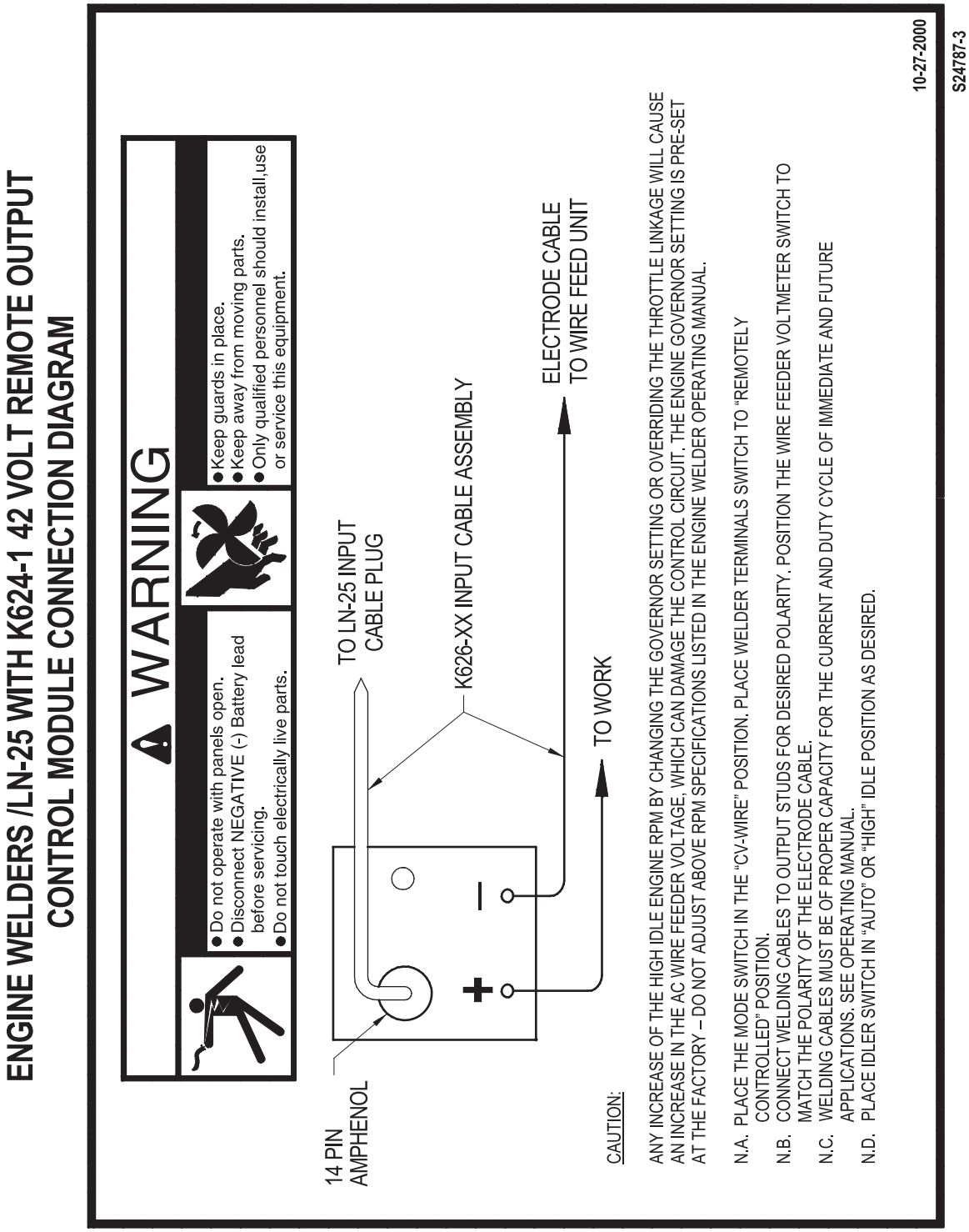
CONNECTION DIAGRAM



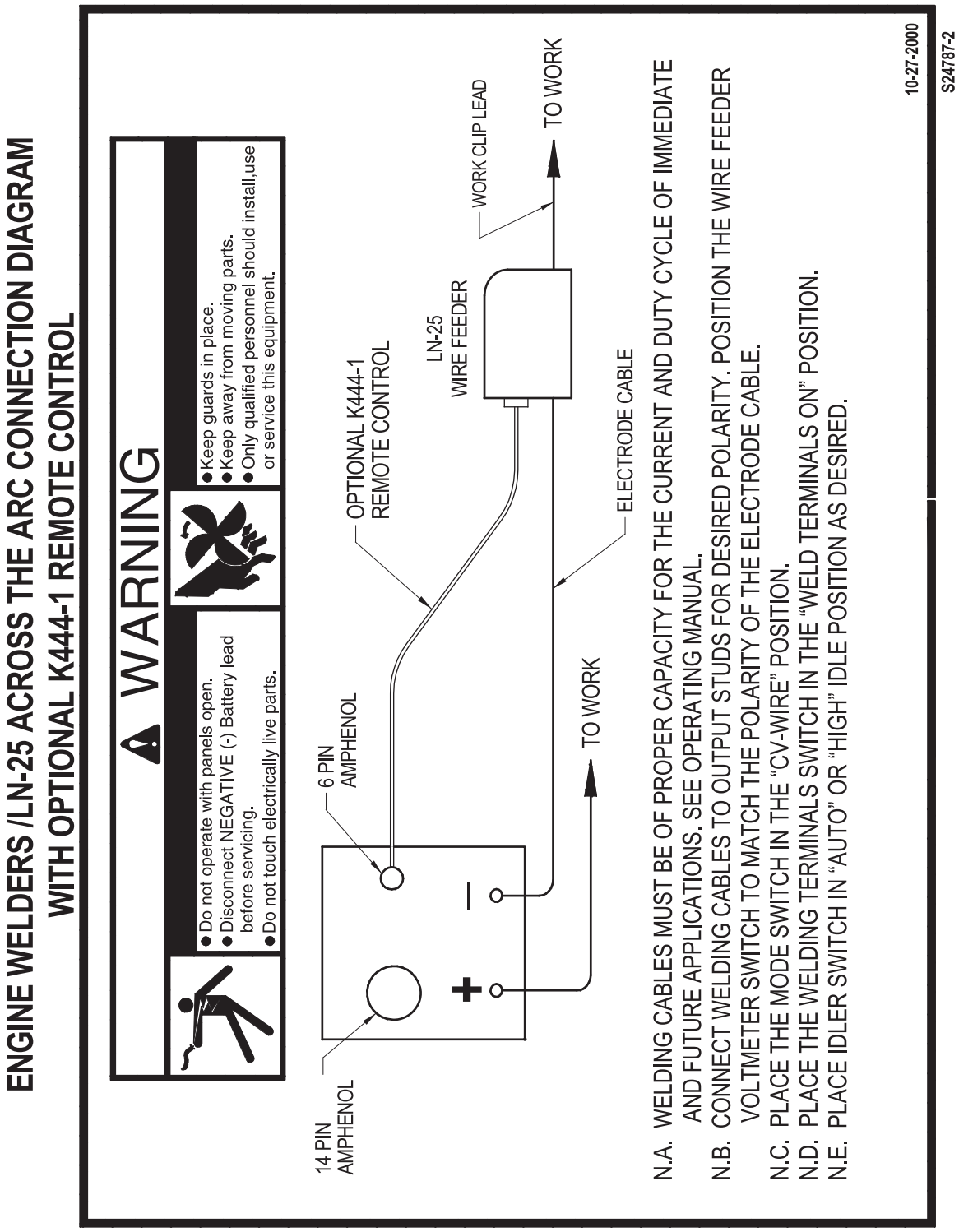
CONNECTION DIAGRAM



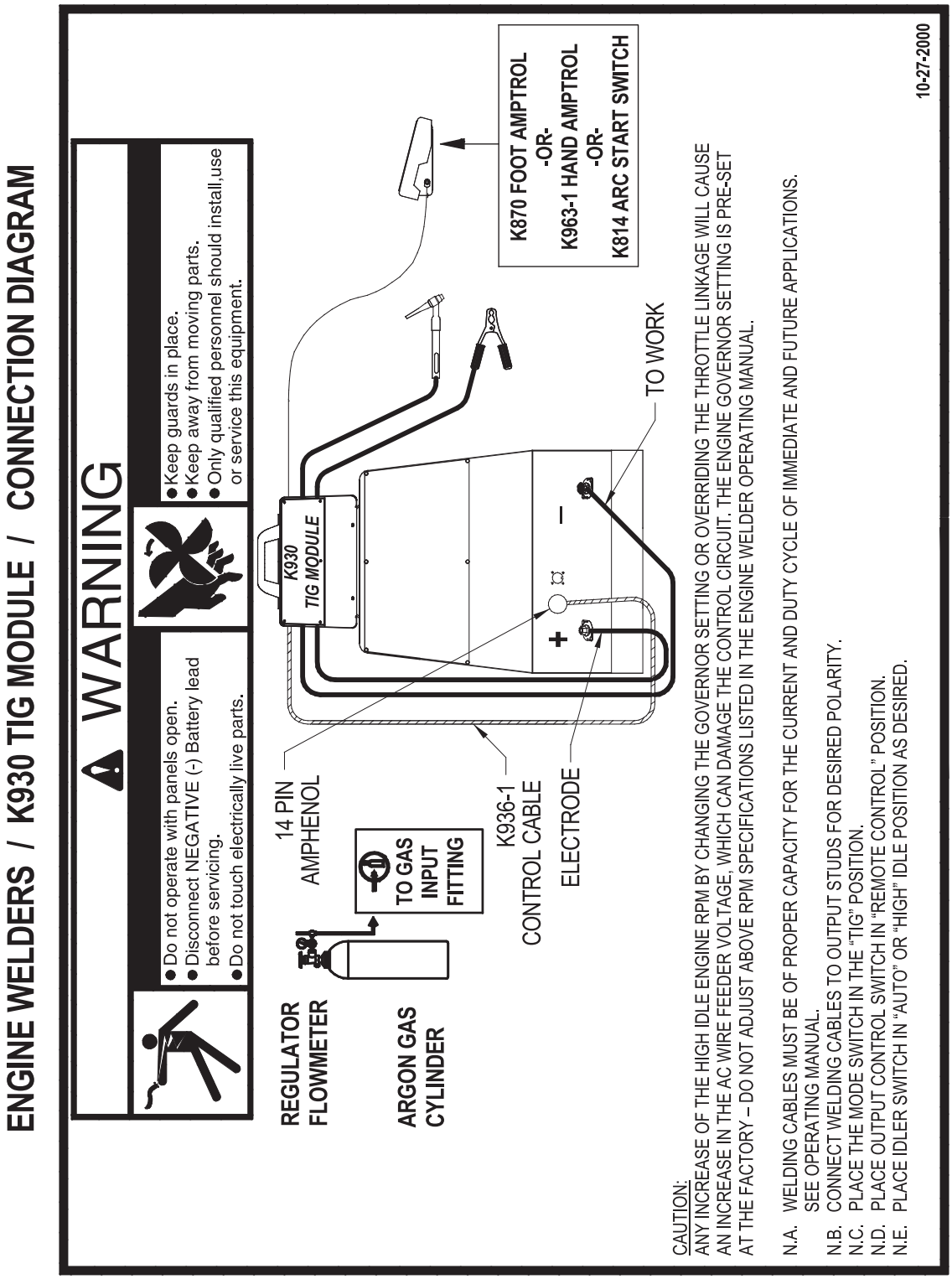
CONNECTION DIAGRAM



CONNECTION DIAGRAM

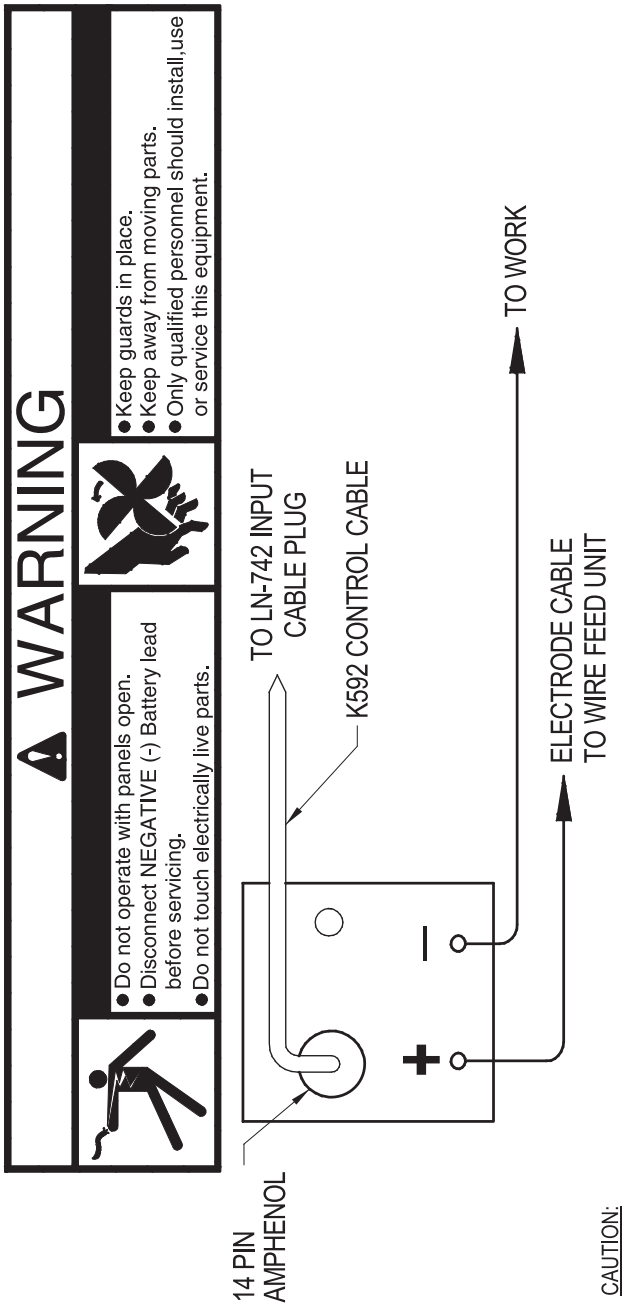


CONNECTION DIAGRAM



CONNECTION DIAGRAM

ENGINE WELDERS /LN-742 CONNECTION DIAGRAM



CAUTION:

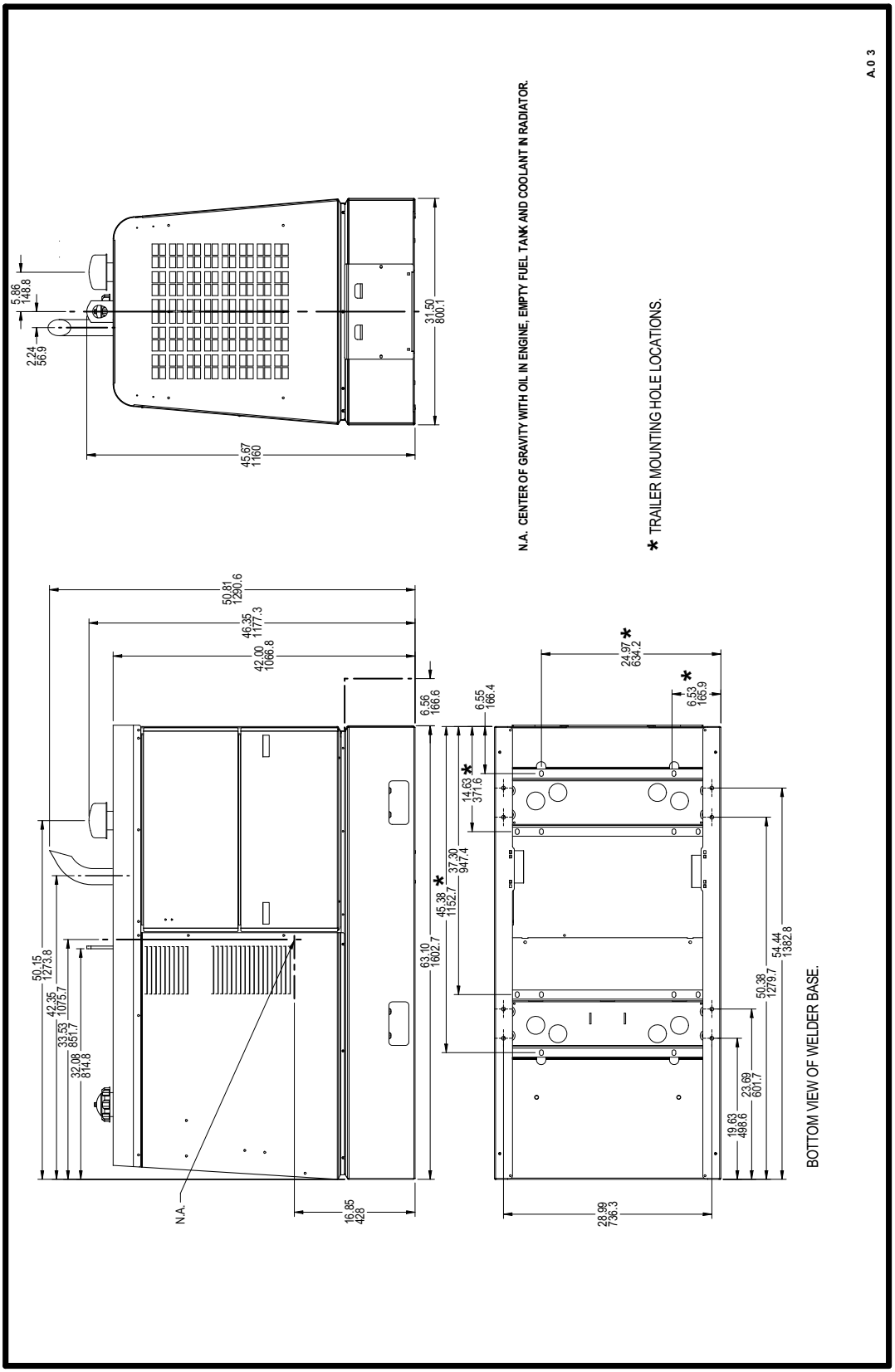
ANY INCREASE OF THE HIGH IDLE ENGINE RPM BY CHANGING THE GOVERNOR SETTING OR OVERRIDING THE THROTTLE LINKAGE WILL CAUSE AN INCREASE IN THE AC WIRE FEEDER VOLTAGE, WHICH CAN DAMAGE THE CONTROL CIRCUIT. THE ENGINE GOVERNOR SETTING IS PRE-SET AT THE FACTORY – DO NOT ADJUST ABOVE RPM SPECIFICATIONS LISTED IN THE ENGINE WELDER OPERATING MANUAL.

N.A. WELDING CABLES MUST BE OF PROPER CAPACITY FOR THE CURRENT AND DUTY CYCLE OF IMMEDIATE AND FUTURE APPLICATIONS. SEE OPERATING MANUAL.
N.B. CONNECT WELDING CABLES TO OUTPUT STUDS FOR DESIRED POLARITY. POSITION THE WIRE FEEDER VOLTMETER SWITCH TO MATCH THE POLARITY OF THE ELECTRODE CABLE.
N.C. PLACE THE MODE SWITCH IN THE "CV-WIRE" POSITION.
N.D. PLACE WELDER TERMINALS SWITCH TO "REMOTELY CONTROLLED" POSITION.
N.E. PLACE IDLER SWITCH IN "AUTO" OR "HIGH" IDLE POSITION AS DESIRED.

10-27-2000

S24787-5

DIMENSION PRINT



M18962-3

NOTE: This diagram is for reference only. It may not be accurate for all machines covered by this manual. The specific diagram for a particular code is pasted inside the machine on one of the enclosure panels. If the diagram is illegible, write to the Service Department for a replacement. Give the equipment code number.

NOTES

NOTES

WARNING	● Do not touch electrically live parts or electrode with skin or wet clothing. ● Insulate yourself from work and ground.	● Keep flammable materials away.	● Wear eye, ear and body protection.
Spanish **AVISO DE PRECAUCION**	● No toque las partes o los electrodos bajo carga con la piel o ropa mojada. ● Aislese del trabajo y de la tierra.	● Mantenga el material combustible fuera del área de trabajo.	● Protéjase los ojos, los oídos y el cuerpo.
French **ATTENTION**	● Ne laissez ni la peau ni des vêtements mouillés entrer en contact avec des pièces sous tension. ● Isolez-vous du travail et de la terre.	● Gardez à l'écart de tout matériel inflammable.	● Protégez vos yeux, vos oreilles et votre corps.
German **WARNUNG**	● Berühren Sie keine stromführenden Teile oder Elektroden mit Ihrem Körper oder feuchter Kleidung! ● Isolieren Sie sich von den Elektroden und dem Erdboden!	● Entfernen Sie brennbarres Material!	● Tragen Sie Augen-, Ohren- und Körperschutz!
Portuguese **ATENÇÃO**	● Não toque partes elétricas e electrodos com a pele ou roupa molhada. ● Isole-se da peça e terra.	● Mantenha inflamáveis bem guardados.	● Use proteção para a vista, ouvido e corpo.
Japanese **注意事項**	● 通電中の電気部品、又は溶材にヒフやぬれた布で触れないこと。 ● 施工物やアースから身体が絶縁されている様にして下さい。	● 燃えやすいものの側での溶接作業は絶対にしてはなりません。	● 目、耳及び身体に保護具をして下さい。
Chinese **警 告**	● 皮肤或濕衣物切勿接觸帶電部件及銲條。 ● 使你自己與地面和工件絶緣。	● 把一切易燃物品移離工作場所。	● 佩戴眼、耳及身體勞動保護用具。
Korean **위 험**	● 전도체나 용접봉을 젖은 헝겁 또는 피부로 절대 접촉치 마십시요. ● 모재와 접지를 접촉치 마십시요.	● 인화성 물질을 접근 시키지 마시요.	● 눈, 귀와 몸에 보호장구를 착용하십시요.
Arabic **تحذير**	● لا تلمس الاجزاء التي يسري فيها التيار الكهربائي أو الالكترود بجلد الجسم أو بالملابس المبللة بالماء. ● ضع عازلا على جسمك خلال العمل.	● ضع المواد القابلة للاشتعال في مكان بعيد.	● ضع أدوات وملابس واقية على عينيك وأذنيك وجسمك.

READ AND UNDERSTAND THE MANUFACTURER'S INSTRUCTION FOR THIS EQUIPMENT AND THE CONSUMABLES TO BE USED AND FOLLOW YOUR EMPLOYER'S SAFETY PRACTICES.

SE RECOMIENDA LEER Y ENTENDER LAS INSTRUCCIONES DEL FABRICANTE PARA EL USO DE ESTE EQUIPO Y LOS CONSUMIBLES QUE VA A UTILIZAR, SIGA LAS MEDIDAS DE SEGURIDAD DE SU SUPERVISOR.

LISEZ ET COMPRENEZ LES INSTRUCTIONS DU FABRICANT EN CE QUI REGARDE CET EQUIPMENT ET LES PRODUITS A ETRE EMPLOYES ET SUIVEZ LES PROCEDURES DE SECURITE DE VOTRE EMPLOYEUR.

LESEN SIE UND BEFOLGEN SIE DIE BETRIEBSANLEITUNG DER ANLAGE UND DEN ELEKTRODENEINSATZ DES HERSTELLERS. DIE UNFALLVERHÜTUNGSVORSCHRIFTEN DES ARBEITGEBERS SIND EBENFALLS ZU BEACHTEN.

● Keep your head out of fumes. ● Use ventilation or exhaust to remove fumes from breathing zone.	● Turn power off before servicing.	● Do not operate with panel open or guards off.	**WARNING**
● Los humos fuera de la zona de respiración. ● Mantenga la cabeza fuera de los humos. Utilice ventilación o aspiración para gases.	● Desconectar el cable de alimentación de poder de la máquina antes de iniciar cualquier servicio.	● No operar con panel abierto o guardas quitadas.	Spanish **AVISO DE PRECAUCION**
● Gardez la tête à l'écart des fumées. ● Utilisez un ventilateur ou un aspirateur pour ôter les fumées des zones de travail.	● Débranchez le courant avant l'entretien.	● N'opérez pas avec les panneaux ouverts ou avec les dispositifs de protection enlevés.	French **ATTENTION**
● Vermeiden Sie das Einatmen von Schweibrauch! ● Sorgen Sie für gute Be- und Entlüftung des Arbeitsplatzes!	● Strom vor Wartungsarbeiten abschalten! (Netzstrom völlig öffnen; Maschine anhalten!)	● Anlage nie ohne Schutzgehäuse oder Innenschutzverkleidung in Betrieb setzen!	German **WARNUNG**
● Mantenha seu rosto da fumaça. ● Use ventilação e exhaustão para remover fumo da zona respiratória.	● Não opere com as tampas removidas. ● Desligue a corrente antes de fazer serviço. ● Não toque as partes elétricas nuas.	● Mantenha-se afastado das partes moventes. ● Não opere com os paineis abertos ou guardas removidas.	Portuguese **ATENÇÃO**
● ヒュームから頭を離すようにして下さい。 ● 換気や排煙に十分留意して下さい。	● メンテナンス・サービスに取りかかる際には、まず電源スイッチを必ず切って下さい。	● パネルやカバーを取り外したままで機械操作をしないで下さい。	Japanese **注意事項**
● 頭部遠離煙霧。 ● 在呼吸區使用通風或排風器除煙。	● 維修前切斷電源。	● 儀表板打開或沒有安全罩時不準作業。	Chinese **警 告**
● 얼굴로부터 용접가스를 멀리하십시요. ● 호흡지역으로부터 용접가스를 제거하기 위해 가스제거기나 통풍기를 사용하십시요.	● 보수전에 전원을 차단하십시요.	● 판넬이 열린 상태로 작동치 마십시요.	Korean **위 험**
● ابعد رأسك بعيداً عن الدخان. ● استعمل التهوية أو جهاز ضغط الدخان للخارج لكي تبعد الدخان عن المنطقة التي تتنفس فيها.	● اقطع التيار الكهربائي قبل القيام بأية صيانة.	● لا تشغل هذا الجهاز اذا كانت الاغطية الحديدية الواقية ليست عليه.	Arabic **تحذير**

LEIA E COMPREENDA AS INSTRUÇÕES DO FABRICANTE PARA ESTE EQUIPAMENTO E AS PARTES DE USO, E SIGA AS PRÁTICAS DE SEGURANÇA DO EMPREGADOR.

使う機械や溶材のメーカーの指示書をよく読み、まず理解して下さい。そして貴社の安全規定に従って下さい。

請詳細閱讀並理解製造廠提供的説明以及應該使用的銀捍材料，並請遵守貴方的有関勞動保護規定。

이 제품에 동봉된 작업지침서를 숙지하시고 귀사의 작업자 안전수칙을 준수하시기 바랍니다.

اقرأ بتمعن وافهم تعليمات المصنع المنتج لهذه المعدات والمواد قبل استعمالها واتبع تعليمات الوقاية لصاحب العمل.

World's Leader in Welding and Cutting Products
• Sales and Service through Subsidiaries and Distributors Worldwide •
Cleveland, Ohio 44117-1199 USA Tel: 216.481.8100 Fax: 216.486.1751 Web Site: www.lincolnelectric.com